

**HEALTH PROMOTION THROUGH SOCIAL MEDIA:  
A CASE STUDY OF TWITTER AND OBESITY**

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## LIST OF ABBREVIATIONS

ABC	Affect, Behavior and Cognition
ASM	Academy of Sciences Malaysia
BMI	Body Mass Index
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IUHPE	International Union for Health Promotion and Education
MCPA	Malaysian CropLife & Public Health Association
NIH	National Institutes of Health
NPD	National Purchase Diary
WHO	World Health Organization

## **PREFACE**

This study was conducted in completion of Bachelor of Marketing (HONS) Final Year Project (FYP) in Universiti Tunku Abdul Rahman (UTAR). Our research topic is “Health Promotion through Social Media: A Case Study of Twitter and Obesity”. This research project aims to explore the knowledge, perception and misunderstanding of obesity Twitter as well as to investigate the utilization of social media in health promotion process by various stakeholders. Meanwhile, this research could be probably vital and contribute to the health promotion industry especially in Malaysia.

The main reason that we choose health promotion industry as our research area is because we would like to explore further on the health promotion industry particularly in Malaysia. Moreover, the previous researchers especially the researchers in UTAR did not focus and study on this industry even though there is a lot of health issues emerged in Malaysia in recent years especially obesity. Furthermore, although the use of social media is becoming more popular, the researchers who explore on the utilization of social media on health promotion are still not much in Malaysia. Therefore, through this research, we fully utilize a social media, Twitter as a platform to collect the perceptions of people towards obesity. Meanwhile, we also develop some of the effective ways that can be used on the social media in order to promote this health issue to aware the public.

## ABSTRACT

Obesity has become a public health issue in many countries around the world and Malaysia is not an exception. Many health promotion campaigns have been launched to promote health and to reduce obesity rate in Malaysia yet these campaign have been less effective in reducing obesity. The underlying issue is that many health promotion campaigns were targeting at obese people without taking public opinions in designing campaign. Meanwhile, social media can be used to collect people's opinions toward obesity regardless of their weights and is a promising tool to promote health to the public. Therefore, the purpose of this study is to explore the knowledge, perception and misunderstanding of obesity through Twitter and investigate the utilization of social media in health promotion process by various stakeholders. Observation on Twitter was carried out and 21 respondents including social media users and experts in nursing and public health were interviewed. Q-methodology is adopted in this study and hence data collected from interview were analyzed using PQMethod 2.35. Three groups of perspectives regarding obesity were identified through analyses which are "Negative Attitude towards Obesity", "Causes of Obesity" and "Positive Attitude towards Obesity. This study is valuable to health promotion organizations and government to improve the obesity situation through campaigns that respond to the beliefs of people coupled with effective health promotion strategies on social media.

*Keywords: Health promotion, social marketing, Twitter, Obesity, Malaysia*



## **CHAPTER 1: RESEARCH OVERVIEW**

### **1.0 Introduction**

This chapter first discusses the research background of this study which is about health promotion, social marketing and social media. It follows by problem statement that elaborates on the issues of obesity and health promotion. Also, research objectives are identified and this chapter ends by highlighting the value of this research to the practitioner as well as academics.

### **1.1 Background of Study**

Health promotion is the science and art of engaging people in actions that can help to optimize their health, based on the definition given by ODonnell (1989). ODonnell believes that health promotion can help people involve in actions toward a healthier lifestyle. Health promotion is emphasizing on physical, psychological and society to generate some ways that help people to avoid health issues such as obesity (Becker, Glascoff, Felts & Kent, 2015). Obesity means that a person is having too much body fat and excess weight. In fact, obesity is a risk factor to many other diseases such as Type 2 diabetes, cancers and it has negative impacts on individual's health, social, families and financial outcomes (National Preventative Health Taskforce, 2008).

In spite health promotion has achieved some advances in promoting health, there have been ineffectiveness in terms of increasing participation within the community (White, Gonda, Peterson & Drum, 2011). Social marketing had become an effective approach in increasing participation within community and it is actively being used in promoting health-related matters. Social marketing refers to using marketing mix strategy to promote health in a society in order to advocate change in behaviour. Social media is a platform that can reach almost all individuals in a society and commonly being used in social marketing studies

recently. Social media is a technology that comprises online communication tools to support and facilitate the social connections between social media users (Hansen, Shneiderman & Smith, 2010).

Currently, there are 2.1 billion online users have active social media accounts (Internet World Stats, 2015). The utilization and propagation of social media has grown up at the rate that the other forms of media which were unable to compare with it. For television, it acquired 13 years to get 50 million users, whereas the Internet acquired only 3 years (McKinsey Global Institute, 2012). Using social media as a promoting channel have grown over the years (Duggan & Smith, 2014). Many companies have used social media as a channel for marketing purposes because this platform has the potential to reach the worldwide (Chen, Wang & Wang, 2010). Health agencies and organizations have proven to be no exception for such uses of online social media (Thackeray, Neiger, Smith & Van Wagenen, 2012). With low cost and high reach, increasing numbers of health promotion campaigns have been deployed through online platforms.

## **1.2 Problem Statement**

In 2014, 1.9 billion of adults in the world whose aged above 18 years old were overweight and 600 million were obese (World Health Organization, 2015). Overall, 39% of them were overweight (38% of male and 40% of female) and 13% were obese (11% of male and 15% of female). In addition, World Health Organization (2015) mentioned 42 million of the world's children population who are under 5 years old were overweight and obese in 2013. Children in developing countries who suffer from overweight and obesity is 30% more than developed countries. Apart from that, a study of Martorell, Khan, Hughes and Grummer-Strawn (2000) showed that 32 out of 50 developing countries have high prevalence of obesity among children at the ages between 1 to 5 years old. Besides, overweight and obesity kill more people than underweight. Jacobs (2014) found that, in year 2010, three to four millions of people died from obesity.

The percentage of obesity is more than doubled from year 1980 to 2014 around the world. A study revealed 10 countries in the world which have the highest rate of obesity, which is the United States, following by China, India, Russia, Brazil, Mexico, Egypt, Germany, Pakistan and Indonesia (Jacobs, 2014). Over the past 20 years, the rate of obesity has tripled in developing countries including Malaysia (Haidar & Cosman, 2011). In a report published by Oxfam International, Malaysia is ranked as the fattest country in Southeast Asia and ranked sixth in Asia Pacific Region (The Star Online, 2014). The prevalence of obesity among adults in Malaysia revealed an increase of 300% in 15 years from 4.4% in 1996 to 15% in 2011 (Khor, 2012). Apart from that, 45.3% of Malaysia population are rated as overweight and obesity (The Star Online, 2014). In other words, almost half of the Malaysian is diagnosed as overweight or obese. The study also stated that about 44% of men and 49% of women are overweight and obese.

Besides, rising of childhood obesity also becomes a critical issue for Malaysia. *Appendix 1.2.1* shows the comparison between children weight in 2001/02 and 2007/08 at aged 6 to 12 years in Malaysia. The result reveals prevalence in obese children from 9.7% to 13.7%. Also, in 5 Malaysian children 1 of them is an obese or overweight child (Project South East Asia, 2015).

Meanwhile, obesity in Malaysia is not only concentrated at urban area, obesity at rural area increases at an alarming rate as well (Academy of Sciences Malaysia, 2013). This shows a difference from those studies stated that obesity rate in low-income countries is higher in urban area while in high-income countries is higher in rural area (Yadav & Krishnan, 2008). Being a high middle-income country, Malaysia has no distinction in terms of the obesity rate between urban and rural areas. In terms of main ethnic groups in Malaysia, according to Institute for Public Health Malaysia Ministry of Health (2011), Indians are the highest, following by Malays and Chinese.

Malaysian government has spent more than RM500 million in health campaigns recently and the result has not produced desired behaviour change since 1980 including programmes about smoking, obesity and many (Consumer Association of Penang, 2011). By noticing the jet-rising obesity issue in the world years ago,

Malaysia Ministry of Health has implemented several social marketing campaigns to combat obesity. Malaysian Health Promotion Board (MySihat) was established to promote healthy eating habit and weight reduction. For instance, “Less Sugar” program to prevent obesity by emphasizing in reducing sugar intake (Consumer Association of Penang, 2011). Next, “Eat Well, Live Well” is a core obesity campaign, it covers few sub-programmes such as “We Care We Share”, “For a Better Policy” and “Twt4Obesity” via Twitter. In addition, “My Weight My Health” is a campaign implemented to tackle weight problem and “10,000 steps a day” is to encourage people to walk more instead of seating (Verma, Chua & David, 2013).

In fact, the mentioned programmes above are not helping in reducing the rate of obesity in Malaysia (Davey, Allotey & Reidpath, 2013). This is because these social marketing campaigns focus primarily on personal responsibility by targeting only at the obese people or other socio-demographic characteristics (Olds, Thomas, Lewis & Petkov, 2013). According to Andreasen (2006), social marketing campaign is more effective when it shifts from targeting only on “problem people” to a broader audience. This means that social marketing campaign should shift from mass messages about personal responsibility, towards more sophisticated attempts to influence behavioural change. This includes using public opinion to influence policy and practice (Brownell, Schwartz, Puhl, Henderson & Harris, 2009).

### **1.3 Research Objectives**

- Explore the knowledge, perception and misunderstanding of obesity through major social media - Twitter.
- Investigate the utilization of social media in health promotion process by various stakeholders.

## 1.4 Significance of Study

Findings of this study will be particularly useful to the Malaysian Health Promotion Board (MySihat). By exploring people's opinions regarding obesity, health promotion campaign can be designed to respond to these beliefs. Indeed, health promotion campaign can be designed to aim at people who have misunderstandings regarding obesity as the first step to help people change behaviour or to reduce the stigmatization of obese people.

Furthermore, exiting beliefs and opinions of people toward obesity such as the opinions pertaining to the causes of and solutions for obesity can help to design an effective obesity prevention policy. For instance, people who think that obesity is caused by environmental factors are likely to accept and support a prevention policy that aims at the public. On the other hand, people who think that weight is a personal responsibility are less likely to support such policy. Therefore, findings about exiting views of obesity are imperative to the government or Malaysia Ministry of Health as support from the public is essential for an effective obesity policy.

Meanwhile, by investigating the utilization of social media in health promotion process by various stakeholders, health promotion strategies on social media can be provided to health promotion organizations in order to improve the effectiveness of health promotion activities on social media.

In addition, this study is significant in that it involves the adoption of Q-methodology for use in addressing a severe public health issue. The methods adopted in this research hold tremendous promise for health promotion researchers addressing issues that have not been benefited from a qualitative inquiry.

## **1.5 Conclusion**

In short, obesity is now a serious public health issue and the exiting health promotion campaigns have been less effective in resolving this issue. This shows a need to conduct this study. Through exploring the knowledge, perception and misunderstanding of obesity and investigating the utilization of social media in health promotion, suggestions about health promotion campaign and strategies on social media can be made for practitioners.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter presents the review of past studies pertaining to social media and health promotion, social marketing as well as obesity and overweight. Besides, the Health Belief Model and the ABC model of attitude are reviewed which help in developing the Q-sample of this study.

### **2.1 Review of the Literature**

#### **2.1.1 Social Media and Health Promotion**

According to Duggan and Brennar (2013), 67% of online users involved in social media sites. The online users with ages 30 to 49 have increased to 82 percent, whereas the ages 50-64 increased to 65 percent (Pew Research Center, 2014). In addition, the online users aged 18 to 24 years old stated that their main source of news is social networking sites (Baumgartner & Morris, 2009).

According to Hampton, Goulet, Rainie and Purcell (2011), 80% of overall Internet users search for information about health through online. In addition, 11% of adults out of 23% of users on social media follow health updates information from other users and there are 7% of adults out of 15% of users on social media receive some of the health information through online. According to Weaver, Mays, Linder, Eroglu, Fridinger and Bernhardt (2009), 59% of adults in US have searched for health information by using Internet while 35% indicated that they understand the emerging health issues by online.

Nevertheless, adoption of social media within healthcare industry falls behind of the other industries when doing comparisons among them (McCaughey, Baumgardner, Gaudes, LaRochelle, Kayla Wu & Raichura, 2014). Only 1,501 hospitals in United States adopted social media which comprises about 16% of overall hospitals around the world (Mayo Clinic Center for Social Media, 2013). This is concerning, because health information-seeking is shifting to social media.

The numbers of audiences and customers involved in communications with public and private sectors in social media platform keep on increasing (Stelzner, 2012). Those public sectors include health promotion and public health. There are a plenty of public health organizations in Malaysia such as Community Health Society Malaysia, Malaysian CropLife & Public Health Association (MCPA) and have utilized the social media (Thackeray & Neiger, 2009).

There are three levels of engagement on social media in health promotion setting (Neiger, Thackery, Burton, Giraud-Carrier & Fagen, 2013). Firstly, low engagement refers to using one-way messaging to reach audiences and providing information instead of asking for audiences' response. Next, medium engagement involves dialogic messaging, meaningful conversations will be created by organization in order to attract followers to retweet or also known as share. Finally, in high engagement, audiences will involve themselves in health promotion programmes either online or offline.

According to Neiger et al. (2013), public health organizations can use monitoring tools in social media to know what their diverse audiences are saying about public health issues, determine the information gaps and improve the messages accordingly. In addition, according to Center for Disease Control and Prevention (2009) and The Canadian Press (2009), Twitter is used to promote health information and to distribute the government alerts to public during the H1N1 flu pandemic.



### **2.1.1.1 Twitter**

Twitter was launched in year 2006 and users use it to interact with other users by sending short messages which are called Tweets (Twitter Help Center, 2015). According to McKinsey Global Institute (2012), Facebook took 1 year to reach 50 million users, while for Twitter, it only took 9 months. Refer to *Appendix 2.1.1.1.1* for the terms and features of Twitter.

Based on Effing, Hillegersberg and Huibers (2011), Twitter has grabbed a lot of research attention as it is largely used by various segments of society. Furthermore, Twitter's default settings are public. To make the tweets being connected to general topics, users can put hashtags together with a keyword to their post. The tweets from all the users are searchable except when the users make their accounts private (Twitter Help Center, 2015). Therefore, Twitter is selected in this study as tweets are searchable on Twitter while it is not possible on other social media sites.

### **2.1.2 Social Marketing**

The first social marketing's description was founded by Kotler and Zaltman and defined the term as a comprehensive role in business marketing activities of idea and behavioural change. Kotler and Lee (2008) gave a new definition in another research which stated social marketing is a process that adopts marketing principles and conveys the value to people and for the purpose of influencing behaviour that brings advantages to society.

Social marketing concept was successfully applied in research of social issues and public health problems, such as reducing obesity (Wymer, 2010), creating awareness of economic in Tanzania (Kikumbih, Hanson, Mills, Mponda & Schellenberg, 2005), renewable energy (Menegaki, 2012), minimizing alcohol harm (Kubacki, 2015), HIV testing (Olshefsky, Zive, Scolari & Zuniga, 2007) and even applied to Malaysia's research in the study of maximizing energy conservation (Low, Mohammed & Choong, 2013).

#### **2.1.2.1 Criteria of Social Marketing**

Andreasen (2002) advocates six benchmark criteria to explain social marketing. First and foremost, behavioral change is the core objective of social marketing, merely creating awareness about the social problems is not social marketing.

According to Andreasen (2002), there must be a formative research to understand the needs and wants of people in the society in order to achieve the social goals. Segmentation can help to identify groups of people with similar needs, so that marketers can design better strategies accordingly (Andreasen, 2002). Besides, what can motivate people voluntarily engage in with something beneficial in return refers to exchange (Stead, Gordon, Angus & McDermott, 2006). Another criterion is competition, meaning when audiences act against the campaigns and thereby bringing negative impacts in the society (Donovan & Henley, 2010).

The center pillar of social marketing is the application of marketing mix to foster social change (Wymer, 2011). Firstly, product defines benefits that will be received by the target audience (Elliot, Rundle-Thiele & Waller, 2014). Next, price refers to the costs that target audiences have to bear in order to exchange with the benefits (Elliot et al., 2014). Whilst, place refers to where and when the target audiences perform their behavior (Elliot et al., 2014). Promotion refers to the ways to inspire target

audiences to change the behavior or action (Elliot et al., 2014). In fact, social marketing is more likely to influence behavior when the benchmark criteria are used (Carins & Rundle-Thiele, 2014).

### **2.1.3 Overweight and Obesity**

According to Bryner (2009), one of ten obese people is satisfied with their body and does not intend to lose weight. In addition, about 8% of the obese people have misperceptions that they have smaller body size (O'Callaghan, 2009).

Njelekela, Muhihi, Mpembeni, Anaeli, Chillo, Kubhoja and Maghembe (2015) stated that majority of the children opposed that obesity is considered good health. According to Bacon, Scheltema and Robinson (2001), people who are fat phobia will have negative attitudes toward obese people such as obese people are undisciplined, inactive and poor hygiene. Likewise, over 50% of physicians felt that obese patients are ugly, awkward and unappealing (McArthur & Ross, 1997).

#### **2.1.3.1 Causes of Overweight and Obesity**

According to Allison, Kaprio, Korkeila, Koskenvuo, Neale & Hayakawa (1996), about 50% of obesity cases are due to inherited. There is a genetic called leptin, when our body lack of leptin, there is a problem giving signal to the brain to eat less (Balentine, 2014). Moreover, according to Center of Disease Control and Prevention (2015), some diseases might cause weight gain such as Cushing's syndrome, hypothyroidism and polycystic ovary syndrome (*Appendix 2.1.3.1.1*). Additionally, people who take their meal in fast food restaurant two times a week will make them increase about four to five kilograms in their weights (Pereira, Kartashov, Ebbeling, Horn, Slattery, Jacobs & Ludwig, 2005).

Other than that, lack of physical activities is another cause. According to Department of Health (2011), adult must spend 2.5 hours to do physical activities or exercise weekly whereas a child must do exercise about an hour daily. Also, if there is a TV within a room, children will have higher chances to gain weight than other child without TV in the room (Delmas, Platat, Schweitzer, Wagner, Oujaa & Simon, 2007).

Furthermore, sleeping habit is one of the causes of obesity as well. Children who sleep less an hour in childhood, they will have 50% chance to get overweight and obesity when they reach 32 years old (Landhuis, Poulton, Welch & Hancox, 2008). Besides, middle age women who sleep only five hours or lesser have 15% higher risk to become obese if compare to women who sleep seven hours (Patel, Malhotra, White, Gottlieb & Hu, 2006).

In addition, stress and negative emotions will contribute to obesity as well. According to HeartMath Institute (2009), 75% of overeating is caused by emotional eating. Without an effective stress management, it will affect the emotion of a person and eventually cause them unable to control their weights (Markowitz, Friedman & Arent, 2008).

Besides, food advertising will influence children's food preferences and their eating behaviour (Hastings, Stead & McDermott, 2003). Institute of Medicine (2006) stated that food marketing will influence food preferences and purchase behaviour as the commercials always advertise high calories foods and beverages.

Lastly, people with higher level of income, education and better occupation while live in a lower income country are more likely to become obese compare to those who live in high income country (Fred, Justin & Patrick, 2012).

### **2.1.3.2 Effects of Overweight and Obesity**

Overweight and obesity can lead to physical health problems such as heart disease or heart attack, high blood pressure, high cholesterol, cancers such as breast, kidney and colon cancer, type 2 diabetes, osteoarthritis, respiratory system and sleep apnea. In 2013, people with body mass index (BMI) over 30 will reduce about three years of lifetime whereas people over 40 BMI will reduce about eight to ten years lifetime (National Health Service Choices, 2015).

In addition, overweight boys and girls have poorer self-image and self-esteem than normal weight. These situations will lead them become cowardly and allow others keep abusing their figure and emotion (Boyd, 2013). Social problem that faced by overweight people are bullying and isolation. According to Harrison (2010), obese children have higher chances to being abuse than normal weight children. Also, people who are depressed and anxious may face problem such as eating disorder or "mindless eating", they might face overeating or night eating (Glinski, Wetzler & Goodman, 2001).

### **2.1.3.3 Solutions for Overweight and Obesity**

To avoid being overweight and obese, parents must be a model for their children. If parents are overweight and lazy to workout, they must do what they are unwilling to do normally in order to encourage their child (Fornicola, 2013). Parents must encourage their children to have a healthy lifestyle.

In addition, we are encouraged to drink at least eight glasses of water in a day. According to Mann (2010), 16 ounces of water before each meal can help to lose weight. Also, practice such as eating the "rainbow", which means making half of the plates with various types of vegetables and fruits (National Institutes of Health, 2012) is another solution.

Nowadays, there are a number of apps available can assist us in losing weight and eating healthy (Skinny Ms., 2013) such as Diet Assistant, Calorie Counter & Diet Tracker and Lose it!. According to Jennifer and Katherine (2011), they found that many people face difficulty on calorie tracking and apps can be very useful and serve as a powerful assistance in such a case.

Another solution is bariatric surgery. Bariatric surgery is needed to remove parts of stomach to make the stomach become smaller and fewer nutrients and calories will be absorbed. This will make us easily feel full and thereby reduce the volume of foods intake. Dr Udomsawaengsup from Thailand (as cited in Murugappan, 2013) said bariatric surgery will make obese people become healthier; they can lose 60%-80% of their weight in one or two years. Bariatric surgery also found effective to people who suffer from metabolic diseases and diabetes.

## **2.2 Review of Relevant Theoretical Models**

### **2.2.1 Introduction of Health Belief Model (HBM)**

According to Hochbaum (1958) and Rosenstock (1974) (as cited in Champion & Skinner, 2008), HBM was designed in 1950 by U.S. Public Health Service's social psychologists. This model was used to explain about many people failed to engage in health programs to detect as well as avoid the disease. HBM focuses on assessing individuals' health behavior by examining their perceptions as well as attitudes towards disease and the negative outcomes of particular actions (Burke, 2013).

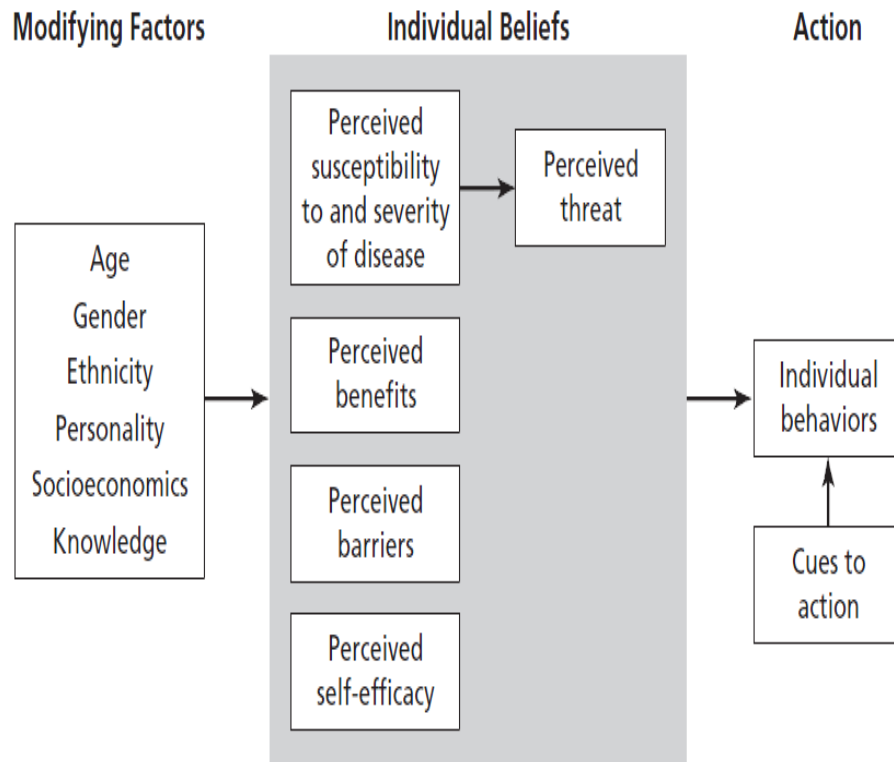


Figure 2.2.1.1: The Health Belief Model

Source: Champion, V. L., & Skinner, C. S. (2008). The Health Belief Model. In Glanz, K., Rimer, B. K., & Viswanath, K. (Eds), *Health Behavior And Health Education* (pp. 45-64). California: Jossey-Bass.

### 2.2.1.1 Key Concepts

Perceived severity refers to a person's belief about the seriousness of a disease and its consequences (Janz & Becker, 1984). This key concept is similar to the "Positive Effect" and "Negative Effect" in our research. Besides, perceived benefit which is alike to the "Prevention" in our study refers to an individual's perception about the effectiveness of a variety of available actions to minimize the disease threat.

Moreover, cues to action are the stimulus that triggers people on making decision to change their behavior or to accept a certain recommended

action about body health. These cues to action can be internal such as pain and symptoms or external such as newspaper, media, people's advice, healthcare providers. Meanwhile, it is about the same with the "Knowledge". Additionally, self-efficacy which close to "Behaviour Change" in our study refers to a person's belief in his or her own ability to successfully execute a behavior needed to generate the outcomes (Hayden, 2014).

Furthermore, perceived susceptibility refers to an individual's belief about the risk of getting a disease (Champion & Skinner, 2008). This key concept is slightly similar to "Self-identity" which implies that a person describes his or her body conditions such as obesity or overweight. Apart from that, perceived barriers refer to an individual's evaluation on the obstacles to execute an advised health action. For example, the action might be expensive and inconvenient (Janz & Becker, 1984). However, this key concept is not adopted.

#### **2.2.1.2 Relationships among the Constructs of HBM**

The constructs of HBM are illustrated in Figure 2.2.1.1 to show the components needed for individual's behavior change. This model consists of three main categories which are modifying factors, individual beliefs and action. Modifying factors contain personality, socioeconomics, knowledge and demographic factors that influence personal health perceptions. Individual health beliefs include five of the HBM's major constructs which are perceived susceptibility, perceived severity, perceived benefits, perceived barriers and perceived self-efficacy. Modifying factors and cues to action will influence these five perceptions. Each of the individual perceptions whether individually or in combination, they will lead to health behavior. The combination of perceived susceptibility and perceived severity is used to determine the threats (Champion & Skinner, 2008).



### 2.2.2 Introduction to ABC Model of Attitude

According to Breckler (1984), attitude can be divided into three components which are affect, behavior and cognition. ABC model measures attitude by evaluating emotional and cognitive components and observing through behavioural responses. This model uses these three components as a basic to explain one's attitude in a certain way during an event happens.

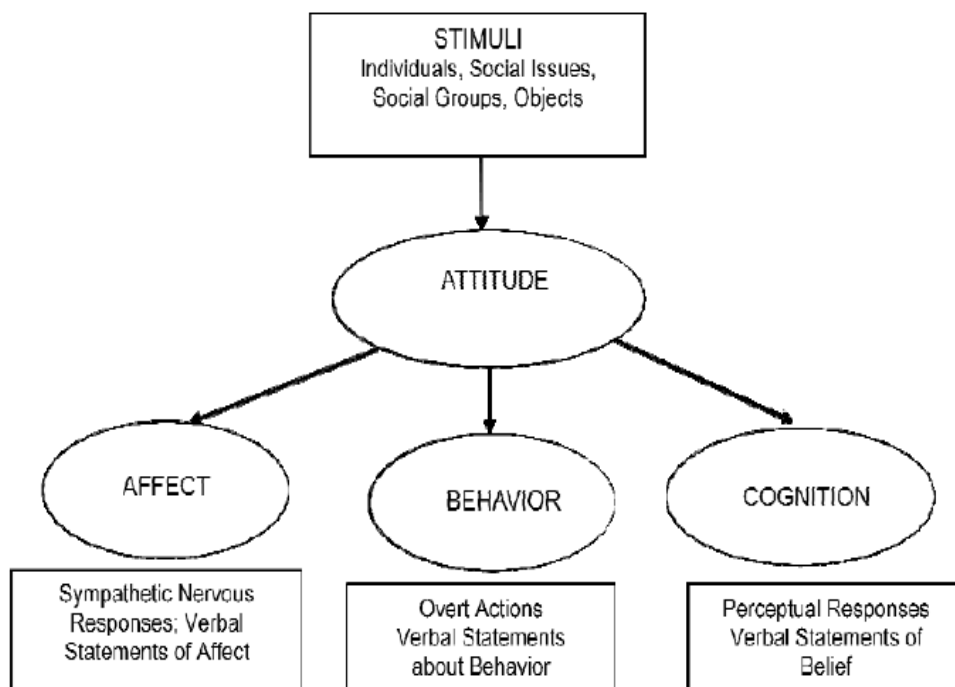


Figure 2.2.2.1 ABC Model of Attitude

Source: Khalid, H. M., Radha, J. K., Helander, M. G. & Jessie Xi, Y (2010). Attitudinal modelling of affect, behaviour and cognition. Report, Damai Sciences SdnBhd, Malaysia, Nanyang Technological University.

### **2.2.2.1 Key Concepts**

In ABC model, A refers to affect, which encompasses feeling and instinct such as enjoyment, displeasure, upset and any emotional response of a person towards a disease. Besides, B refers to behavior, which explains the way that a person behaves towards a disease. Lastly, C refers to cognition and is a set of factors and rational arguments encompasses beliefs, options and perceptions of an individual towards the disease (Khalid, Helander & Hood, 2013).

### **2.2.2.2 Relationships among the Constructs of ABC Model of attitude**

In Figure 2.2.2.1, attitude forms because influenced by stimuli from the environment. Stimuli include social issues, social groups, objects, events as well as individual. Furthermore, attitude is further broken down to three sub-categories; affect contains sympathetic nervous responses and verbal statements. Next, behavior contains overt actions and verbal statements. Last, cognition contains perceptual responses and verbal statements as well. This model allows an inconstant change among three sub-categories, which means there are interrelated with each other (Rosenberg & Hovland, 1960).

## **2.3 Conclusion**

In brief, this chapter discusses about past studies and shows relationships of different factors and models. The following chapter will further discuss about the research methodology.

## **CHAPTER 3: METHODOLOGY**

### **3.0 Introduction**

This chapter presents the methods used in conducting this research. It starts with research design, follows by rationale for using Q-methodology, method of reasoning, research instrument, construct measurement, sampling design, data collection methods and lastly data analysis.

### **3.1 Research Design**

#### **3.1.1 Qualitative Research**

Qualitative approach is selected due to the difficulty in using survey to study individual's views related to obesity on social media. People might have forgotten what they share on social media or might be unwilling to reveal. Therefore, in this research, Q-methodology is applied to explore the relationship between perception, attitude and misunderstanding to obesity.

#### **3.1.2 Exploratory Research**

This research is an exploratory research as the aim is to explore knowledge and perceptions of people toward obesity through Twitter. Moreover, exploratory research is used to study topics with little past studies in order to formulate more accurate research questions which future study may answer (Neuman, 2006). The rationale for conducting exploratory research is that there has been little research studying the linkage between obesity and using social media as a promotional tool.

## 3.2 Rationale for Employing Q-Methodology

This research adopts Q-methodology as it allows an examination of subjectivity systematically. The analysis in Q-methodological study is a purely technical and objective procedure which helps to minimize biases that often associate with qualitative research.

In fact, Q-methodology is very suitable in this study since Q-sorting requires respondents to evaluate statements in their mutual coherence instead of isolation (Brouwer, 1999). Therefore, opinions of people toward obesity are more fruitfully studied when respondents compare each statement.

Meanwhile, results of Q-methodology can describe a population of standpoints and this makes Q-methodology a very powerful technique to explore beliefs and views which are the part of personality that have considerable effect on behavior yet are usually unexplored. Refer to *Appendix 3.2.1* for the steps in Q-methodological study.

## 3.3 Method of Reasoning

Q-methodology is not a pure qualitative method and thus is in between inductive and deductive reasoning. Inductive reasoning begins with observing patterns and from that to eventually arrive some general and probable conclusions (William, 2006). On the other hand, deductive reasoning starts with reviewing theory and from that to develop specific hypotheses and by addressing the hypotheses to arrive some certain conclusions (Sternberg, 2009). This study uses an inductive reasoning which begins with observation of nature, with the purpose of searching a few, powerful statements about how nature works. Factors are interpreted using inductive reasoning that puts away theory and the Q-sort blueprint and allows an understanding of the factor to emerge spontaneously from the data.

### 3.4 Research Instrument

#### 3.4.1 Q-Sample

The procedure for developing Q-sample is shown in the following figure.

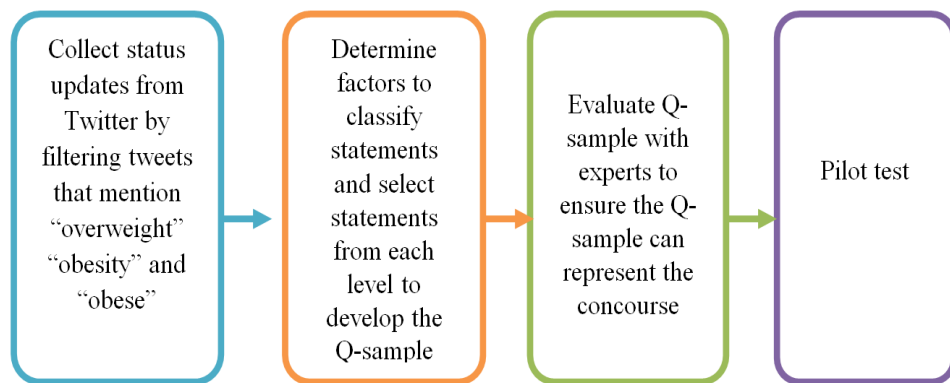


Figure 3.4.1.1: Procedure for developing Q-sample

The instrument development started with the collection of tweets pertaining to obesity. The observation was performed in April 2015 on a daily basis. Upon completion, there were 550 statements in the concourse. Structured Q-sample is employed since it is developed more systematically and statements are grouped according to factors which help to overcome bias and preference in selecting statements (Akhtar-Danesh, Baumann & Cordingley, 2008; Paige & Morin, 2014).

Three categorizations of the statements were performed. The first and second categorizations were using main categories to categorize statements. The second categorization was performed one week after the first categorization in order to have new insights looking at all statements and to see the consistency of the results between first and second categorizations. A third categorization was using sub-categories to categorize statements. Q-sample was developed by selecting an equal number of statements from each sub-category.

According to Brown (1980), 40 to 60 statements are sufficient to elicit current viewpoints. Generally, number of Q-statements ranges from 20 to 100 (Dennis, 1986; Watts & Stenner, 2005). Statements with the highest tweets and favourites in each sub-category were selected since they represent the current popular issues. It was planned to select three statements from each sub-category. Nevertheless, it was difficult to select three statements in two sub-categories. These sub-categories were decided to keep instead of removing due to the number of tweets and favourites are extremely high. Upon completion, there were 76 statements in the Q-sample. Refer to *Appendix 3.4.1.1* for the structure of Q-sample.

The edited, original Q-sample and the concourse were evaluated with a Q-methodology expert. The expert was requested to check the readability and clarity of the edited Q-statements as well as if the Q-statements illustrate the breadth and depth of concourse. Apart from that, experts in public health and nursing were invited to ensure heterogeneity in Q-sample.

Pilot test was carried out on three social media users. Statements were revised given the feedback collected from the pilot tests. Refer to *Appendix 3.4.1.2* for the Q-statements.

## **3.5 Construct Measurement**

### **3.5.1 Factors in First Categorization**

Each researcher separately identified factors after reviewing literature and statements in the concourse. The factors identified by each researcher were being discussed. Once the consensus was reached, statements were categorized into the agreed upon factors by the four researchers together (Refer to *Appendix 3.5.1.1* for the factors identified by each researcher and the factors applied in first categorization).

### **3.5.2 Factors in Second Categorization and Final Factors**

After the first categorization (Refer to *Appendix 3.5.1.1* for the first batch of factors), statements in “Perception” and “Effect” were found containing both positive and negative aspects. As a result, four researchers all agreed to further divide “Perception” into “Positive Perception” and “Negative Perception” and “Effect” was separated into “Positive Effect” and “Negative Effect”.

Also, many statements in “Information” were found pertaining to the tips of avoiding or curing obesity. Thus, “Prevention” was identified for statements about tips of avoiding or curing obesity and “Knowledge” was identified to replace “Information”. The second categorization was done by applying this set of revised factors and the result of the second categorization was evaluated with the expert. The final factors were determined given the feedback of the expert. Refer to *Appendix 3.5.1.1* for the changes made in factors.

### **3.5.3 Sub-categories in Third Categorization**

Sub-categories of “Cause”, “Knowledge” and “Behaviour Change” were developed by reviewing literature and statements. Meanwhile, sub-categories of “Positive Attitude” and “Negative Attitude” were based on the ABC model of attitude. Additionally, sub-categories of “Positive Effect”, “Negative Effect” and “Prevention” were based on the definition of health defined by the WHO. According to WHO (2006), health can be defined in three aspects which are physical, mental and social well-being. Nevertheless, statements in “Positive Effect” were found lack of aspects of psychological and societal and therefore consisting of only “Physical”. Lastly, no sub-category was identified for “Self-identity” as the statements in this category does not differ significantly. Refer to *Appendix 3.5.3.1* for the definition of factors and sub-categories.

## **3.6 Sampling Design**

### **3.6.1 Target Population and Sample**

The target population of this study is social media users in Malaysia who are from Gen X and Y. As Baumgartner and Morris (2009) mentioned, social networking sites are the main source of news to Gen Y. Individuals from Gen X are selected due to the rising number of these individuals participating in social media (Pew Research Center, 2014). In brief, the target population is Malaysian social media users with age between 20 and 50.

Respondents include Twitter users, Facebook users as well as experts in health field. Experts in health fields are recruited since these people are considered having different perspectives toward obesity which can help to enhance the findings.



### **3.6.2 Sampling Technique and Size**

In Q-methodology, respondents are chosen purposively with the hope that they will have various perspectives on the issue being studied (Dennis, 1986). Hence, this study employs judgmental sampling which is a non-probability sampling technique to select respondents who are relevant to the study.

As stated by Brown (2004), in Q-methodology, as much diversity as possible on variables such as gender and age should be achieved when choosing respondents. Therefore, efforts to ensure diversity were made by taking demographic factors into consideration and by including experts in health field.

As mentioned by Brown (1980), 40 to 60 participants are usually adequate but in some cases, even fewer may be adequate. Therefore, the sample size of this study is 21.

## **3.7 Data Collection Methods**

### **3.7.1 Observation**

Observation was carried out on Twitter. Direct observation was performed where the researchers did not involve in the context. Researchers merely monitored the tweets regarding obesity instead of participating in the conversation of people on Twitter.

### 3.7.2 Interview

The interviews were conducted between 1 June 2015 and 18 June 2015. 7 respondents were interviewed through Skype and 14 respondents completed the Q-sorting through e-mail. Generally, most of the respondents took approximately 90 minutes to complete the interview and all respondents can complete it within two hours.

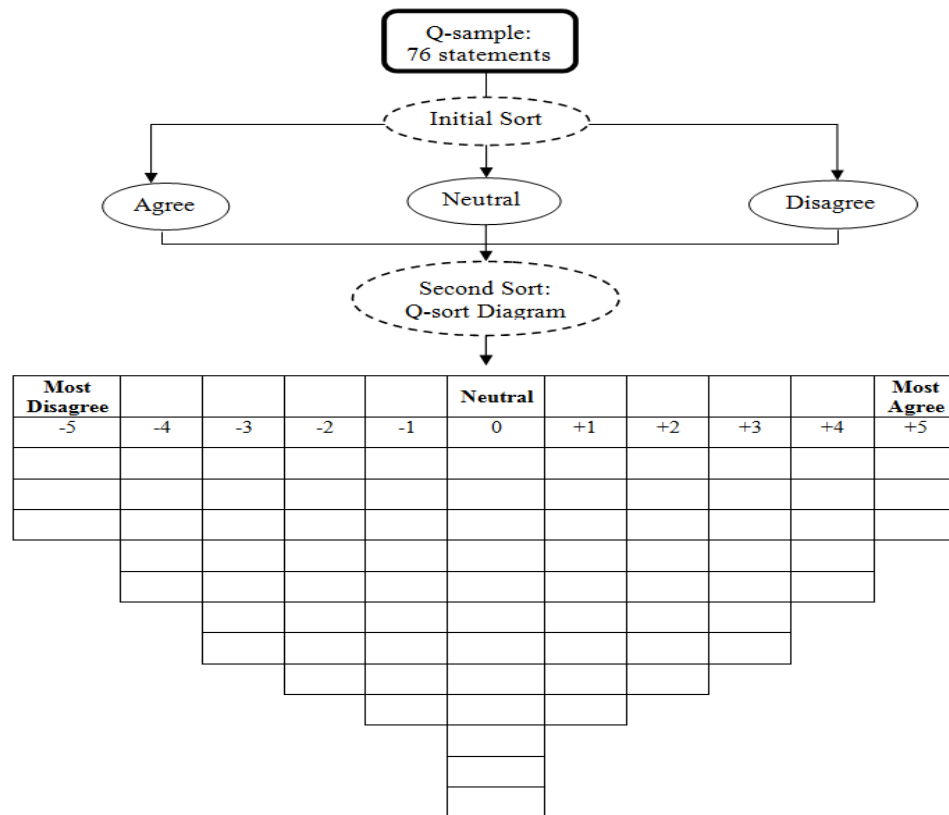
In the Skype interview, a Microsoft Excel file containing Q-statements and Q-sort diagram (Refer to *Appendix 3.7.2.1* for more information about the development of Q-sort diagram) was sent to the respondents for doing the Q-sorting.

For e-mail Q-sorting, four files were sent to the respondents which are as follow:

- ✓ Overview of Interview (*Refer to Appendix 3.7.2.2*)
- ✓ Q-sorting instructions (*Refer to Appendix 3.7.2.3*)
- ✓ Excel file to do the Q-sorting (*Refer to Appendix 3.7.2.4 to 3.7.2.8*)
- ✓ Q-sample questionnaire (*Refer back to Appendix 3.7.2.9*)

In E-mail Q-sorting, communications about the process of the interview are included in the “Overview of Interview” which gives the respondents a general understanding about the interview and the “Q-sorting instructions” which provides guidelines for doing the Q-sorting.

According to Van Tubergen and Olins (1979), there is a high consistency between results generated from self-administration Q-sorting and in-person Q-sorting. Furthermore, a study measuring computer- and interview-based Q-sorting found that there is no obvious difference in the reliability or validity (Reber, Kaufman & Cropp, 2000).



In the initial sort, respondents categorize all the 76 statements into agree, disagree and neutral. In the second sort, all the 76 statements must be sorted relative to one another on the Q-sort diagram. Refer to *Appendix 3.7.2.10* for more details about the Q-sorting process or you can refer back to *Appendix 3.7.2.3* for the Q-sorting instructions.

## 3.8 Data Analysis

PQMethod 2.35 is used to determine whether statistically significant factors exist and determine data patterns. Q-methodology consists of three main sets of statistical procedures which are correlation, factor analysis and factor score calculation (McKeown & Thomas, 1988).

### 3.8.1 Reliability and Validity

Factor reliability in Q-methodology is using a test-retest procedure. The test-retest reliability of each respondent's sort is measured in reliability coefficient which depicts whether the respondents will sort in the same or similar way in the future (Dennis, 1992). According to Brown (1980), using the same set of Q-statements on the same respondents yet at various time yielded a correlation coefficients of 0.80 or greater. Therefore, composite reliability is computed by adopting the expression below (Brown, 1980).

$$r_{xx} = \frac{0.80p}{1 + (p-1) 0.80} ; \text{ where } p = \text{number of defining sorts in the factor}$$

Validity in Q-methodology includes content and face validity of the Q-statements. Reviewing literature and inviting domain experts are common practices to assure content validity of the statements (Polit & Beck, 2008). Besides, face validity can be assured by exact wordings or with only minor editing of the statements (Valenta & Wigger, 1997).

### 3.8.2 Correlation and Factor Analysis

In Q-methodology, correlations between persons instead of variables are factored (Stephenson, 1935). A correlation matrix shows the degree of (dis)similarity between the individual sorts. In factor analysis, Eigenvalues which is the sum of squared factor loadings for each factor are used to order factors in terms of their importance. Factors with Eigenvalues higher than 1.00 are significant while factors with Eigenvalues lower than 1.00 are insignificant (Brown, 2004).

Once factors have been identified, it is necessary to rotate the factors. This study adopts Varimax factor rotation which is a strictly mathematical and offers an orthogonal solution (Kline, 1994). Varimax rotation can aid purity of the factors by trying to eliminate as much as possible the effects of less similar sorts (McKeown & Thomas, 1988).

Once factors are rotated, factor loadings will be identified and they represent the variation or commonality of each Q-sort within the factors. Q sorts with a very high loading on only one factor are pure while Q sorts loading on more than one factor are confounded. Q sorts who do not achieve a significant load do not resemble any of the resulting factors (Webler, Danielson & Tuler, 2009).

The formula for computing factor loading significance is  $\alpha < .01$ ; significance =  $2.58 (1/\sqrt{N})$ ; while  $N$  refers to the number of Q-statements (McKeown & Thomas, 1988). The significance level of  $\alpha < .01$  is appropriate as it is more rigorous and thus further limits opportunities for consensus while ensuring statistical significance for defining sorts.

### **3.8.3 Factor Scores and Factor Arrays**

A statement's factor score is the normalized weighted average statement score of Q sorts that define that factor (van Exel & de Graaf, 2005). These scores are first expressed as normalized z-scores yet they can be converted into the factor arrays in the same whole number of the rating scale used in the Q-sort diagram. Once converted, composite Q sort for each factor are produced which represent how a hypothetical respondent with a 100% loading on that factor would have ordered all the Q-statements.

## **3.9 Conclusion**

In brief, this chapter discusses the research methodology of this study with details regarding Q-methodology. The data collection starts from collecting statements on Twitter to interviewing respondents. Data gathered from the interview are analysed using PQMethod 2.35. Results and interpretations of the analysis will be presented in the following chapter.

## **CHAPTER 4: DATA ANALYSIS**

### **4.0 Introduction**

This chapter first starts with the findings of Twitter which gathered from the observation follows by analysis and results generated by the PQMethod 2.35. Once all the 21 Q-sorts data were entered into the PQMethod for analysis and gone through the three statistical procedures mentioned in the previous chapter, factor interpretations follow which help to define the factors by interpreting the salient statements identified by the PQMethod.

### **4.1 Findings of Twitter**

Through observation on Twitter, it was found that numbers of individuals' tweets are the highest, follows by pages' and organizations'. The numbers of tweets posted by various organizations are disproportional handful compared to individuals' and pages'. These organizations are mainly daily news and magazine publishers instead of organizations in the health promotion or related health field. The pages referred here are not owned by organizations, instead, are just pages developed by individual for sharing information on Twitter. For instance, Amazing Facts, Naija Gym Blog and Fitness Motivation.

With respect to the number of favourites and retweets, individuals' tweets received the most attentions, follows by pages' and organizations. This shows that organizations merely utilize social media to release health information related to obesity instead of interacting with the audiences. Interestingly, the same contents posted by various parties have shown distinct numbers in favourites and retweets. This implies that the tweets which gain lots of attentions are attributed to famous individual, organization and pages on Twitter instead of the content itself.

## 4.2 Demographic Profile of Respondents

In the interview, participants complete the demographic questionnaire once they have done the Q-sorting. Aspects covered in the demographic questionnaire include age, gender, race, education level, occupation and Twitter account status. All questions are structured besides occupation. Hence, occupation is classified into 4 groups which are academic staff, student, clerk and IT staff based on the data generated from the questionnaire.

As depicted in Table 4.2.1, majority of our participants is aged between 21 to 30 years old (71.43%). Meanwhile, more than half of all participants are female (61.9%) and Chinese (80.95%). In terms of education, nearly all the respondents are holding at least a diploma level certificate (90.48%). Student (38.1%) and academic staff (42.86%) make up the majority of the respondents. Lastly, only 3 out of 21 are frequent Twitter users (14.29%).



Table 4.2.1: Demographic Profile of Respondents

Variables		Frequency	Cumulative Frequency	Percent	Cumulative Percent
Age	20 or Below	0	0	0	0
	21-30	15	15	71.43	71.41
	31-40	2	17	9.52	80.95
	41-50	4	21	19.05	100
	50 or Above	0	21	0	100
Gender	Male	8	8	38.1	38.1
	Female	13	21	61.9	100
Race	Malay	2	2	9.52	9.52
	Chinese	17	19	80.95	90.48
	India	2	21	9.52	100
Education	Secondary School	1	1	4.76	4.76
	STPM / A-Level	1	2	4.76	9.52
	Diploma / Advance Diploma	6	8	28.57	38.09
	Bachelor Degree	5	13	23.81	61.9
	Master Degree	8	21	38.1	100
	PhD ( Doctorate)	0	21	0	100
	Other	0	21	0	100
Occupation	Academic Staff	9	9	42.86	42.86
	Student	8	17	38.1	80.96
	Clerk	2	19	9.52	90.48
	IT Staff	2	21	9.52	100
Twitter User	Yes	3	3	14.29	14.29
	No	18	21	85.71	100

### 4.3 Reliability and Validity Tests

As can be seen in Table 4.3.1, Factor 2 has the highest composite reliability (0.923), followed by Factor 1, 4, 5 and 6 which have the same composite reliability (0.889). Nevertheless, Factor 3 has the lowest composite reliability (0.800). As stated by Brown (2000), a factor reliability of 0.95 is sufficiently high to have a clear understanding of the factor. In short, least confidence can be placed in factor 3 and acceptable confidence can be placed in Factor 1, 2, 4, 5 and 6.

Table 4.3.1: Factor Characteristics

	Factor					
	1	2	3	4	5	6
No. of Defining Variables	2	3	1	2	2	2
Average Reliability Coefficient	0.800	0.800	0.800	0.800	0.800	0.800
Composite Reliability	0.889	0.923	0.800	0.889	0.889	0.889
S.E. of Factor Z-scores	0.333	0.277	0.447	0.333	0.333	0.333

Content validity is assured as the statements are first categorized by reviewing literature and subsequently experts in public health, nursing and Q-methodology are invited to ensure the Q-sample can represent the concourse and ensure heterogeneity in the Q-sample. In fact, only a very slight revision of grammar on Q-statements was made and the Q-statements were checked with the research team members and one expert to assure face validity.

## 4.4 Correlation and Factor Analysis

A correlation matrix can be found in *Appendix 4.4.1*. As shown in Table 4.4.1, Eigenvalues of Factor 1, 2 and 4 are greater than one which indicates that these factors are significant. On the other hand, Factor 3, 5 and 6 are lower than one which means they are insignificant. As a consequence, only Factor 1, 2 and 4 deserve special attentions in the factor interpretation. A complete table of the unrotated factor matrix can be found in *Appendix 4.4.2*.

Table 4.4.1: Unrotated Factor Matrix

	Factors					
	1	2	3	4	5	6
Eigenvalues	6.3543	1.2256	0.9969	1.0103	0.8301	0.5365
% ExplVar*	30	6	5	5	4	3

\*% ExplVar: Percentage of explained variance

Once the factors have been extracted, automatic flagging was used to point out sorts who load significantly on the identified factors. In this study, standard error for a zero-order correlation ( $p < .01$ ) can be given by the expression  $2.58 / \sqrt{76} = \pm 0.2959$ . Hence, Q sorts whose factor loading exceed  $\pm 0.2959$  on only one factor are pure loaders (defining sorts) of that particular factor. Based on Table 4.4.2 (loading with an X indicating a defining sort), Factor 2 is defined by three Q-sorts while Factor 1, 4, 5 and 6 are represented by two Q-sorts. Nevertheless, Factor 3 is only defined by one Q-sort.

Notably, although factor loading of Q sort one on Factor 2 (0.3129) exceeds 0.2959, it does not define Factor 2 as its factor loading on Factor 1 (0.2183) is very close to 0.2959 at the same time its factor loading on Factor 2 (0.3129) does not exceed 0.2959 significantly. As a result, Q sort one is considered confounded Q sort as well.

Table 4.4.2: Factor Matrix

Q Sort	Loadings					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
19.	<b>0.8615X</b>	0.1188	-0.0186	0.0831	0.1789	0.1992
16.	<b>0.5212X</b>	0.3072	-0.0541	0.2789	0.0877	0.0932
21.	0.2202	<b>0.6770X</b>	0.2071	0.2693	0.2837	0.1159
15.	0.0063	<b>0.5764X</b>	0.0270	0.0119	-0.0029	0.1730
6.	0.0730	<b>0.4549X</b>	-0.1804	0.0502	0.1581	-0.0409
11.	0.0250	-0.0266	<b>0.8086X</b>	0.0689	-0.0034	-0.0196
7.	0.0968	0.0628	0.0369	<b>0.8594X</b>	-0.0423	0.1543
9.	0.1360	0.1159	0.0692	<b>0.6863X</b>	0.1550	0.1256
5.	0.0611	0.2071	0.0228	0.0050	<b>0.5243X</b>	0.0283
20.	0.3297	0.0671	-0.0672	0.2419	<b>0.6159X</b>	0.0335
12.	0.1841	0.3570	-0.2279	0.0766	0.0446	<b>0.5132X</b>
14.	0.1169	0.2848	-0.0556	0.3823	-0.2152	<b>0.5403X</b>
1.	0.2183	0.3129	0.0231	0.0507	0.0889	0.1991
2.	0.4590	0.1555	0.1682	0.1885	0.2018	0.5273
3.	0.1407	0.1266	-0.3416	0.2164	0.4155	0.3869
4.	0.1715	0.4800	-0.2762	0.3268	0.2043	-0.1629
8.	0.3259	0.1949	-0.2108	0.5210	0.2924	0.0365
10.	0.3844	0.3243	-0.2637	0.3208	0.1902	0.3010
13.	0.0130	0.3023	-0.1438	0.4172	0.3053	0.3061
17.	0.2802	0.0645	0.1350	0.4275	0.3072	0.4024
18.	0.3655	-0.0596	0.0653	0.3397	0.1538	0.3604
% Expl. Var.	10	9	6	12	7	8
X indicating a defining sort.						

## 4.5 Factor Scores and Factor Array

Ideally, correlation between factor scores should be low since lower correlations between factors enhance the confidence that the factors are more distinct than alike. Typically, researchers look for these correlations to be less than 0.5. As can be seen in Table 4.5.1, correlations between factors are all less than 0.5000, ranging from -0.1329 to 0.4437.

Table 4.5.1: Correlations between Factor Scores

Factor	1	2	3	4	5	6
1	1.0000					
2	0.3496	1.0000				
3	-0.0355	0.0947	1.0000			
4	0.2510	0.2947	0.0891	1.0000		
5	0.4084	0.3690	-0.0592	0.2149	1.0000	
6	0.3308	0.4437	-0.1329	0.3518	0.1132	1.0000

To be noted, only Factor 1, 2 and 4 are warranted factor interpretation and it is expressed as Factor I, II and III respectively in the following section. Normalized factor scores for these three factors are included in *Appendix 4.5.1*, *4.5.2* and *4.5.3*. The resulting factor arrays can be found in *Appendix 4.5.4*, *4.5.5* and *4.5.6*.

## 4.6 Factor Interpretation

PQMethod will help to identify the salient statements that are used to interpret the factors through factor and difference scores computation. Characterizing and distinguishing statements of Factor I, II and III are attached in *Appendix 4.6.1.1*, *Appendix 4.6.1.2* and *Appendix 4.6.1.3* respectively.

### 4.6.1 Factor I: Negative Attitude towards Obesity

Refer to characterizing statements in *Appendix 4.6.1.1*, Factor I strongly agrees that being obese is related to several mental and physical issues (36: +5). This shows a negative attitude towards obesity since obesity is thought as having negative effects. As commented by Sorter 19 (defining sort of Factor I) on statement 36:

*“It’s true that people who are suffering from obesity also suffering with mental issues such as insults from others, and physical issues as there are certain activities they can’t perform or act.”*

At the same time, Factor I highly disagrees that looking healthy means looking fat and looking normal means looking obese (7: -5). Apparently, this factor thinks that being fat is unhealthy and obesity is thought as abnormal which again highlight a negative attitude towards obesity. As mentioned by Sorter 19 on this statement:

*“Being obese is not healthy with many side effects. Hence, being obese is never normal. It should fall under the category of unhealthy.”*

Besides, Factor I feels annoyed towards obese people who feel great to be obese (20: +4). Meanwhile, “Plus Size Model” is not supported in this factor (32: +4). Also, Factor I agrees that obese people should make a change towards a more healthy body figure (15: +4) which indicates that obesity is not encouraged in this factor. Obviously, this factor has a negative attitude towards obesity. Consequently, Factor I is characterized by “Negative Attitude” towards obesity.

Nonetheless, Factor I strongly disagrees that taxing obese people is a solution to battle obesity even though Factor I does not embrace obesity (57: -5). As commented by Sorter 19 on this statement:

*“Implementing tax on obese people to discourage obesity is unfair to the obese people and may not work. Governments also impose tax on cigarettes to discourage smokers, but it is not working. People are still smoking everywhere.”*

Refer to distinguishing statements in *Appendix 4.6.1.1*, Factor I completely agrees that higher prices of healthy foods and lower prices of unhealthy foods are contributing to obesity while Factor II and III feel neutral and disagree with it respectively (18: +5, 0, -1). As commented by Sorter 19:

*“It’s the fact that healthy foods are often more expensive than unhealthy foods and as for people who look highly on their money will tend to go for cheaper priced foods.”*

In fact, people are more likely to accept an obesity prevention policy that aims at the society instead of the obese people only if they think that the cause of obesity is attributed to the surroundings. From statement 18, it can be seen that the environment can be a possible cause to obesity in this factor. Moreover, looking at statement 57 (obesity tax), it can infer that Factor I does not prefer obesity prevention policy that aims at only obese people.

Also, Factor I highly agrees that obese people are struggling with mental and physical issues while Factor II and III do not agree (36: +5, 0,-3). Lastly, it seems that starvation is an acceptable solution to tackle obesity in Factor I while it is not acceptable in Factor II and III (15: +4, -3, -5).

#### **4.6.2 Factor II: Causes of Obesity**

Refer to the characterizing statements in *Appendix 4.6.1.2*, Factor II strongly agrees that bad diet will lead to overweight or obesity rather than lack of exercise (63: +5) at the same time disagrees that obesity is caused by watching too much of television (76: -4). As Sorter 21 (defining sort of Factor II) commented on statement 76:

*“This is a ridiculous and unproven fact.”*

Although Factor II agrees that bad diet is one of the causes, it does not agree that McDonald's targets children to ensure that future generations grow up obese and lethargic (29: -4). In other words, this shows that Factor II feels that maintaining a healthy diet is a personal business instead of attributing the cause to the commercial activity. Since Factor II feels that obesity is caused by the individuals themselves, this suggests that Factor II might prefer obesity prevention policy that targets on obese people only.

Besides, Factor II thinks that obesity can also be caused by higher level of stress (48: +4) and eating disorders (70: +4). Other than this, Factor II completely agrees that calling obesity a disease will not help obese people to lose weights and make healthy choices (1: +5). Obviously, Factor II shows that the main reasons that cause obesity are due to unbalance and unhealthy diet, mental issues and health condition instead of lack of physical activities. As a number of statements regarding causes are being



highlighted in Factor II, thus, Factor II is characterized by “Causes” of obesity.

Refer to the distinguishing statements in *Appendix 4.6.1.2*, Factor II extremely agrees that calling obesity a disease will make people become less motivated to lose weights and make healthy choices but Factor I and III disagree with this statement (1: -3, +5, -2). Sorter 15 (defining sort of Factor II) commented on this statement:

*“We should not call obesity as a disease because it would make obese people less motivated to have a healthy life.”*

Other than this, Factor II seems like unaware of the facts that obesity can be unhealthy. This can be seen from the distinguishing statements that Factor II disagrees with. Factor II feels neutral about those obese people struggling with mental and physical problems, however, Factor I strongly agrees with this statement and Factor III disagrees with it (36: +5, 0, -3). Factor II disagrees that obesity can be unhealthy and disagrees that obesity may lead to heart attack while Factor I and III both agree with this (20: +4, -2, +1). Lastly, Factor II is the only group that believes that it is great and okay to be obese (35: +2, -3, +4).

### **4.6.3 Factor III: Positive Attitude towards obesity**

Refer to the characterizing statements in *Appendix 4.6.1.3*, “Love your body movement” is being accepted by Factor III, at the same time Factor III is aware that obesity can have negative consequences (51: +5). As Sorter 7 (defining sort of Factor III) mentioned:

*“There must be a fine balance between the need to have proportionate or fit body and going overboard.”*

In the meantime, Factor III highly disagrees that being obese is as dangerous as being anorexic and also believes that one of these serious issues is not protected via “anti-shaming” and “body positivity” (4: -4). As can be seen from the statements mentioned above (51: +5; 4: -4), Factor III has a positive attitude towards activities that promote a positive way to look at overweight and obesity such as “Body Positivity”.

Besides, Factor III is totally against fat shaming and Factor III is aware that it is not great to be obese or overweight (35: +4). Meanwhile, Factor III feels very motivated when seeing an overweight person is working hard in the gym (53: +4). Also, Factor III strongly agrees that obesity is becoming a real problem in the United Kingdom (67: +5). Interestingly, Factor III is aware of the dangers of being obese yet at the same time Factor III has a more positive attitude to look at obesity such as accepting the “Body Positivity” activity. As a consequence, Factor III is characterized by “Positive Attitude” towards obesity.

In contrast, Factor III completely disagrees with the statement that mentions an overweight teen tries to defend himself with having a slow metabolism and is a nervous eater (74: -5). The Sorter 7 stated:

*“People who failed to see the real problem could not even begin to attempt to solve their problem. Failure to diagnose the actual issue is going to worsen the situation.”*

Furthermore, Factor III also believes that starvation is not the way to remove fat (15: -5). As sorter 7 mentioned:

*““Starvation to lose weight” give me a break!!! One must practice balanced diet.”*

According to the distinguishing statements in *Appendix 4.6.1.3*, it can be seen that Factor III entirely agrees that obesity is becoming a real problem

in the United Kingdom while Factor I and II feel neutral with it (67: -1, 0, 5). As commented by sorter 7:

*“Obesity is not only in the UK, but unfortunately in all around the world. Perhaps due to the negative side of overall economic prosperity and technological leap.”*

#### **4.6.4 Consensus among Three Factors**

There are 33 consensus statements in *Appendix 4.6.4.1* and the table shows each factor’s grid position for these 33 statements along with the general description of the position for every statement.

### **4.7 Conclusion**

Overall, three factors are identified as significant through performing factor analysis. In this chapter, findings from Twitter observation and various groups of opinions toward obesity are interpreted and discussed which will be helpful in providing suggestions to the health promotion activities on social media. Next chapter will present the implications of the results coupled with limitations of this study and recommendations for future research.

## **CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS**

### **5.0 Introduction**

This chapter presents a summary of the previous chapters and findings discussed in the last chapter. Furthermore, implications and limitations of this study are addressed coupled with recommendations for further research and lastly followed by an overall conclusion for this study.

### **5.1 Summary & Discussion of Major Findings**

Three factors are identified as significant through analyses performed by PQMethod 2.35. Factor I and III are pertaining to attitude yet these two factors differ in the ways of perceiving obesity. Factor I is not comfortable with obese people who think that obesity can be beautiful at the same time it is against “Plus Size Model” initiative. On the other hand, Factor III is fine with the “Body Positivity” activity which boosts body image at any weight.

Majority of the statements in Factor II are regarding causes of obesity which is different from Factor I and III with statements mainly regarding attitude towards obesity. Additionally, it is imperative to note that Factor II believes that obesity is not really a severe issue and judges the extent of obesity to be less extreme than Factor I and III which makes it differs from Factor I and III.

One of the research objectives in this study is to explore the knowledge, perceptions and misunderstanding of obesity through major social media. Therefore, as result shown, Factor I, “Negative Attitude” towards obesity, shows there is recognition that obesity is unhealthy or even obesity is not beautiful. This result is consistent with the research conducted by Brewis, Wutich, Falletta-

Cowden and Rodriguez-Soto (2011) that found negative attitudes toward fat bodies in nine diverse locations around the world. According to Brewis et al. (2011), a rapid globalization of fat stigma where obese people are increasingly viewed as ugly, undesirable, lazy or lacking in self-control. Meanwhile, based on the study of Rebecca and Chelsea (2010), it found that fat stigma is not a helpful public health tool for reducing obesity.

Factor II, “Causes of Obesity”, indicates that this factor is largely concerning about the potential reasons of obesity. Among the reasons of obesity, dietary habit and health condition are highlighted. Indeed, unhealthy diet is the main contributor to obesity (WHO, 2009). Despite of that, excess in watching television is not deemed as a potential contributor to obesity in Factor II. In fact, research revealed that television watching could promote obesity by displacing time for physical activity, promoting poor diets and even by interfering with sleep (Strasburger, 2011). In addition, it seems that gene and family factor are one of the overlooked factors of obesity as well.

Factor III, “Positive Attitude” towards obesity, which demonstrates a more positive way to look at obesity. This finding is consistent with a survey conducted by the market research firm NPD Group (National Purchase Diary) which found America’s attitudes toward obese people are shifting from rejection to acceptance given the increasing number of overweight and obese people in the United States (as cited in NBCNEWS, 2006).

Unfortunately, behaviour change, effects and prevention did not appear to be significant factors. This implies that people do not have profound knowledge about prevention and potential detrimental effects of obesity. In brief, messages regarding behaviour change, prevention and detrimental effects of obesity are not gaining great attentions on social media which make these factors insignificant.

Another research objective is to investigate the utilization of social media in health promotion process by various stakeholders. Therefore, as findings shown, there is only low engagement between organizations and audiences. This result is similar to the study conducted by Schein, Wilson & Keelan (2010) who found utilization of social media in public health communications is still in infancy stage.

## **5.2 Implications of the Study**

### **5.2.1 Managerial Implications**

Based on our research findings, there is a group of people possess negative attitude towards obesity. Therefore, Malaysian Health Promotion Board (MySihat) or government should provide more positive and constructive announcement to the public. Meanwhile, through literature review, health promotion campaign should increase participation within community in order to be more effective. Therefore, greater-scale obesity prevention campaigns that initiate social changes to help changing the environmental conditions which cause obesity should be created. In fact, supportive environment can enhance health and lower health disparities regardless of people's weight, this helps to reduce weight stigma as well.

In the meantime, findings found that only dietary habit and health condition are the factors mostly being aware. In spite of this, excess in watching television, gene and family factors as well as lack of sleep are among the factors that have been overlooked. As a consequence, health promotion organizations should emphasize the causes which have been overlooked on social media.

In addition, this study found that there is a group of people having positive attitude towards obesity by perceiving obesity can be beautiful at the same time recognizing obesity is unhealthy. This is an appropriate attitude that

should be held by the public. Thus, relevant organizations should educate the public with this attitude towards obesity on social media in order to encourage or motivate their surrounding obese friends or family to lose weights and practice a healthy lifestyle.

On the other hand, behavior change, effects and prevention of obesity are not being addressed by social media users. This shows that people might lack of information or knowledge about these three factors. Consequently, health promotion parties should emphasize more about the seriousness of getting obesity, ways to prevent from being obese as well as the benefits to get rid of the obesity.

Through the literature review and Twitter observation, social media play an important role in health promotion activities. It was found that the tweets which gain plenty of attentions are attributed to famous individuals instead of attractiveness of the content. Hence, health promotion organizations should invite people who are famous and have a lot of followers as well as great influence on social media such as Jamie Oliver who is a celebrity chef in the United Kingdom, while for Malaysia, actress such as Tan Sri Michelle Yeoh or Mr. Lim Guan Eng who is the Chief Minister of Penang in order to effectively promote the messages stated above. With these top influential people spreading the messages on social media, there is a greater chance for the public to read and spread out the messages to their friends or followers and even take some actions such as practicing the healthy lifestyles stated on the post.

Also, low engagement between organizations and audiences was found through Twitter observation. Therefore, related organizations should make good use of social media to interact with users and eventually involve users in health promotion programme such as through co-creating content. For instance, health promotion organizations can also partner with those who have successfully changed from being obese to being fit in order to make these stories as positive messages on social media to initiate discussions among social media users and thereby achieving higher level of engagement.

### **5.2.2 Theoretical Implications**

This study enhances the current literature by furnishing more useful information related to obesity from the viewpoint of Malaysian. Although there are plenty of past studies studying the perceptions of the community toward obesity, limited researches have been written in the context of Malaysia. Likewise, there have been little studies integrating social media in the research of health promotion particularly about the obesity. Thus, through this research, current literature is improved with more useful information about social media and health promotion related to obesity.

In addition, this research has also achieved a differentiation from other past studies. This research demonstrates a different approach from other past studies which is to implement Q-methodology to investigate people's opinions toward obesity. Hence, this research can be useful for health promotion researchers who have not been benefited from a qualitative inquiry. Besides, this study collected people's opinions via Twitter as Twitter can represent individual user's attitude and opinions toward public issue.

### **5.3 Limitation of the Study**

The first limitation is that the respondents in this research are not sufficiently diversified. Respondents are limited to individuals who can understand English as the statements are all expressed in English. In fact, people who cannot understand English or live at rural area might show a different perspective on obesity issue. Also, approximately 81% of the respondents are young adults (21- 40) and the rest are in the middle age group (41-50). Since this study wants to investigate the utilization of social media in health promotion related to obesity, lots of the senior citizens are not qualified to be the respondents as they mostly are not social media users. Insufficient of diversity among respondent is acknowledged yet this does not detract from the significance of findings but merely provide platforms for future research.



In addition, using Twitter to study the utilization of social media in health promotion related to obesity might not be adequate as there are also plenty of other social media sites on the Internet. Despite of that, using only Twitter can be justified as today's social media sites are linked with each other. In other words, posts appear in Twitter can also be found in Facebook as social media users now can share the same posts on multiple social media sites simultaneously.

## **5.4 Recommendation for Future Research**

Future research can translate the Q-statement into different languages and to investigate the perspectives of people who cannot understand English. Apart from that, future research can investigate the perspectives of senior citizens toward obesity as well since obesity is not only an issue to the young adults and middle-age individuals.

Also, future study can try to monitor multiple social media sites such as Facebook, Youtube or even Instagram to collect statements since the concourse is not limited to text, it can comprise of pictures as well. It would be interesting to identify whether the result will be different by monitoring multiple sites even though using only Twitter is still deemed acceptable given the interrelated attribute of social media.

Last but not least, future researchers are encouraged to not limit their investigation solely on obesity. There are many other health issues as well such as coronary heart disease, hypertension, liver disease, diabetes and so on and these are among the popular health issues in Malaysia.

## **5.5 Conclusion**

In brief, this study aims to explore the knowledge, perception and misunderstandings of people toward obesity through major social media. The results have shown various perceptions of people toward obesity and highlighted the causes of obesity which have been overlooked. Meanwhile, this study found low engagement between organizations and audiences by investigating the utilization of social media in health promotion process. Hence, this study is beneficial for health promotion organizations and government to develop health promotion and intervention programme related to obesity on social media for improving the obesity epidemics.

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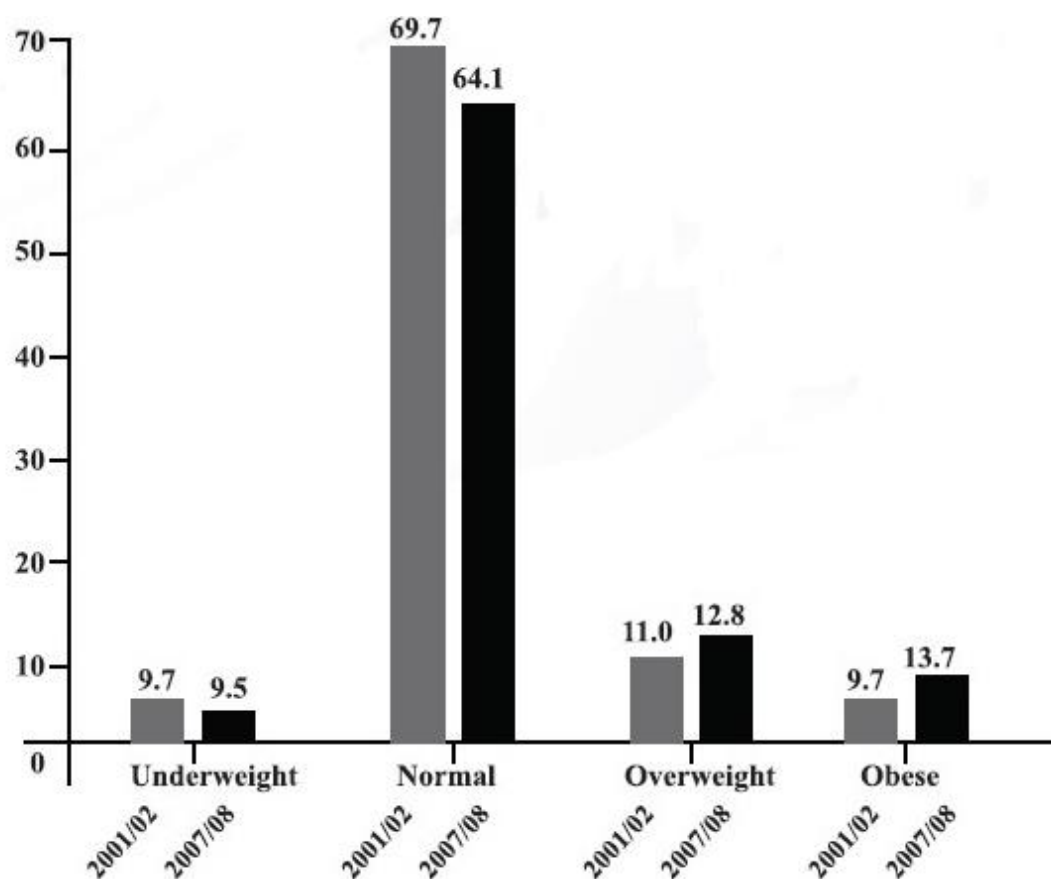
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## APPENDICES

### *Appendix 1.2.1: Overweight and obesity rate in children age 6 to 12 years in Malaysia*



Source: Ministry of Health Malaysia. (2010). Malaysian Dietary Guidelines. Retrieve April 6, 2015, from <http://dg.cnsoc.org/upload/affix/20140818104029708.pdf>

*Appendix 2.1.1.1.1: The terms and features of Twitter.*

Twitter Terms	Features and Aspects
Tweet	Each message you sent out to followers on Twitter.
Follower	The other Twitter users who follow you and receive your updated Tweets.
Retweet	The act of reposting or sharing other Twitter user's Tweets to your followers.
Favorite	The act of liking a particular tweet.
Follow	The act of subscribing to a specific Twitter account.
Hashtag #	It is a function to help the users search the tweets which contain the specific topic or keyword easily.

Source: Twitter Help Center. (2015). The Twitter Glossary. Retrieved 3 May, 2015, from <https://support.twitter.com/articles/166337>

*Appendix 2.1.3.1.1: Disease cause obesity*

<b>Diseases</b>	<b>Explanation</b>
Cushing's Syndrome	When adrenal glands produce too much of cortisol it will cause weight gain, especially on the chest, stomach and face (Ratini, 2015).
Hypothyroidism	It will produce too little thyroid hormones that will affect the speed of metabolism become slow and gain weight (Ratini, 2015).
Polycystic Ovary Syndrome (PCOS)	PCOS cause obesity or obesity cause PCOS, both are possible. Women who suffer in PCOS will produce too much of insulin and insulin produced unable to function normally, and this will make women gain weight or difficult to lose their weight (Hignett, 2011).

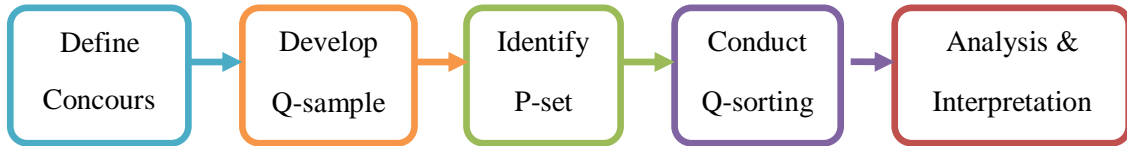
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### Appendix 3.2.1: Steps in Q-methodology

A Q-methodological study comprises of five major steps and this is presented in the flow chart below.



- The first step is to collect statements which can represent the ordinary dialogue, conversation and discourse of people regarding a particular topic. The statements collected are known as concourse (Brown, 1993).
- The second step is to develop a Q-sample or also known as Q-set (Bartlett & DeWeese, 2015) that can represent the concourse. Q-sample is a subset of statements which are drawn from the concourse (van Exel & de Graaf, 2005).
- The third step is to select individuals who have clear and distinct opinions of the topic being studied for participating in the Q-sorting (Bartlett & DeWeese, 2015). The participants involving in a Q-sorting are known as P-set (Brown, 1993).
- The forth step is to conduct the Q-sorting. The steps in Q-sorting are as follows (Bartlett & DeWeese, 2015). Firstly, the P-set will be given the condition of instruction. Next, P-set will be asked to sort the statements into three major categories which are agree, disagree and neutral. Finally, P-set will be required to rank the statements using the Q-sort diagram. Also, an interview can be conducted subsequent to the Q-sorting (van Exel & de Graaf, 2005).
- Last step is to analyze the Q-sort data obtained in the previous step and interpret the results.
- Factor scores on a factor's composite Q sort and difference scores point out the salient statements that deserve special attention in describing and interpreting that factor. Usually, the statements ranked at both extreme ends of the composite sort of a factor, called the characterising statements,

are used to produce a first description of the composite point of view represented by that factor.

- The distinguishing and the consensus statements can be used to highlight the differences and similarities between factors. Finally, the explanations Q sorters gave during the follow-up interview can be helpful in interpretation of the factors (van Exel & de Graaf, 2005).

Sources:

Bartlett, J. E., & DeWeese, B. (2015). Using the Q Methodology approach in human resource development research. *Advances in developing human resources*, 17(1), 72-87.

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*Appendix 3.4.1.1: Structure of Q-sample*

Categories (Factors)	Sub-categories (Levels)	No. of levels	No. of statements in Q-sample
Cause (C)	(a) Inactive lifestyle (CIL) (b) Genes & family factors (CG) (c) Health Condition (CH) (d) Emotional factors (CEF) (e) Lack of sleep (CLS) (f) Unhealthy diet (CU) (g) Wealth condition (CW) (h) Business Activities (CB)	8	22
Positive Effect (E+)	(a) Physical (E+PH)	1	3
Negative Effect (E-)	(a) Physical (E-PH) (b) Psychological (E-PS) (c) Society (E-S)	3	9
Positive Attitude (PA)	(a) Cognitive (PAC) (b) Affective (PAA) (c) Behavioral (PAB)	3	9
Negative Attitude (NA)	(a) Cognitive (NAC) (b) Affective (NAA) (c) Behavioral (NAB)	3	9
Knowledge (K)	(a) Information (KI) (b) Awareness (KA)	2	6
Behaviour Change (B)	(a) Lifestyle (BL) (b) Exercise (BE)	2	6
Prevention (PV)	(a) Physical (PVPH) (b) Psychological (PVPS) (c) Society (PVS)	3	9
Self-identity (S)			3
		<b>Total</b>	<b>76</b>

Source: Developed for the research

Appendix 3.4.1.2: Q-statements

No.	Statements
1.	Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.
2.	Study identifies childhood obesity as a risk factor for dropping out of school.
3.	Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.
4.	Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".
5.	Foods that are high in nickel are linked to obesity in some women.
6.	Plus Size Appreciation is not promoting obesity. It's making people who are constantly put down feel good about themselves.
7.	You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.
8.	Several new studies add to a body of evidence that being overweight may have health benefits.
9.	Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.
10.	When more people are dying from obesity than starvation, there is a big problem.
11.	You see fat families? When the mum is obese. The dad is obese. And so are the kids? Sickening. They should be banned from public.
12.	An anti-obesity law has passed in Japan. It's now illegal to be overweight or fat in Japan.
13.	Training leg is painful especially when you are an overweight baby boomer. But I am going to do this.
14.	Wealthier men have a higher rate of obesity than poor. Poor women have higher rate of obesity than wealthier women.
15.	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.
16.	Overweight type-2 diabetes patients outlive thinner ones, study says.
17.	Teenagers who misperceive their weight as overweight are actually more likely to overeat compared to teenagers who accurately perceive their weight.
18.	I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.
19.	If you make fun an overweight person working out at the gym I'll key your vehicle.

20.	Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would not be loving your curves.
21.	Lack of sleep is putting children at risk of overweight and obesity.
22.	Obese people may have lower dementia risk.
23.	Being overweight is unhealthy and it is your personal responsibility to do your best to become fit. Please do.
24.	People at a normal weight who believe they are fat have a much greater risk of becoming obese later in life.
25.	If I was getting overweight or obese, and my friends were telling me "Rock it girl", "love yourself". I would get away from these friends.
26.	Eating micronutrient or fiber-rich bar two times per day increase metabolism and decrease inflammation in obese people without diet change.
27.	Fat is harmful and obesity should not be a badge of pride.
28.	I'm apparently overweight but I look good? Strange.
29.	McDonald's targets children to ensure that future generations grow up obese and lethargic.
30.	I can say this because I was obese. I've been there and made all the excuses! Stop mollycoddling people & promote healthy lifestyle change!
31.	Dr. Allen Litcher: "Obesity will likely surpass smoking as the leading preventable cause of cancer."
32.	Being overweight is not healthy so I do not understand why people are arguing that 'plus size models' should be in the public eye.
33.	Stop promoting being morbidly obese as beautiful. You wouldn't do it with anorexia, it's not beautiful. It's a death sentence.
34.	Hyperinsulinemia drives diet-induced obesity independently of brain insulin production.
35.	I am totally against fat shaming, but do not tell people that it is great and okay to be obese or overweight.
36.	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.
37.	Every time my dad sees an overweight person & says "Look at that fat fuxx." saves me from letting my weight get out of control.
38.	I despise parents who say that it is not their fault that their child is overweight.
39.	Studies suggest standing more could lower risk for obesity, illness, and death.
40.	15 minutes of laughter everyday can help reduce your risk of obesity and boost your metabolism.
41.	4 out of 5 firefighters in US are overweight or obese, and about half of firefighters killed in the line of duty suffer heart attacks.

42.	Important reminder: not every overweight person dislikes their body and wants it to change!!! Do not project societal standards on us!!!
43.	No respect for people attacking overweight people at the gym who are trying to turn their life around.
44.	I was once obese. Trust me, you're lying to yourself if you have the 'as long as I'm happy' mentality to justify your condition.
45.	I'm: So stressed. So depressed. So obese. So exhausted. So fat. So ugly. So worthless. So unwanted. So disappointing. So disgusting.
46.	1-4 children in America are obese, but please keep telling me how bad cutting weight is for my body.
47.	I'm sorry but the people who embrace obesity only do so because they're too lazy to fix it.
48.	Reduced stress level can help obese people to lose weight.
49.	A salon owner claims that obese staff ruined her business by sneaking out for takeaways.
50.	One way to lose weight? Studies show obesity is lower in marijuana users than in non-users.
51.	I love this whole love your body movement, but if you are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.
52.	Pizza Hut offers free pizza to everyone called Charlotte this weekend, as a token of their devotion to childhood obesity.
53.	Seeing an overweight person working hard in the gym is very motivating for me.
54.	Obesity is a rich people problem.
55.	Standing desks are coming to schools, to cure obesity and increase attention spans
56.	Physical inactivity is a bigger risk factor for early death than "Smokadiabesity" (smoking, diabetes and obesity together).
57.	The government were saying that, they might implement an obesity tax, as a scheme to battle obesity.
58.	A new study shows many overweight people have a distorted self-image. They tell themselves, I'm not fat. I'm just easy to see.
59.	Everyone is getting skinny and I am getting obese.
60.	Parents rarely spot child obesity.
61.	I am overweight and this is nothing but facts. We should not promote unhealthy lifestyles.
62.	I used to tell myself I'm naturally overweight, I'm naturally big boned. But there are no fat people. Take Action!
63.	Obesity due to bad diet not lack of exercise.
64.	You think I haven't tried to lose weight? Ask most overweight women and they have tried it is not as black and white as you may think.
65.	Overweight prevalence of pre-school children in ASEAN. It is alarming!!!

66.	I've met a few people who say they don't like the taste of water. They were all obese. I assume it's correlated.
67.	Obesity is becoming a real problem in the United Kingdom.
68.	I was overweight but when I started doing gymnastics, I lost weight and I am not that skinny but confident.
69.	Obesity is a frequently overlooked factor that can contribute to an increased cancer risk.
70.	Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.
71.	Being the highest percentage of obese people in South East Asia is not helping in our progress for a better Malaysia. Pondering times.
72.	For each hour of sleep lost, the odds of an adolescent being obese rise by 80%.
73.	I admire an overweight person in the gym trying to get right. I was once there, my friends.
74.	Overweight teen tries to defend himself: I have a slow metabolism. I'm a nervous eater. I'm related to RubeusHagrid (character in Harry Potter, who is a giant human).
75.	I hate when I go shopping and I can't find sizes for overweight people, it's so difficult to find and when you find something it's horrible.
76.	Watching too much television can cause kids to be overweight and obese.

*Appendix 3.5.1.1: Development of Factors*

Researcher (Initial Categories)				Categorizations		Final
A	B	C	D	1 <sup>st</sup>	2 <sup>nd</sup>	
Side Effect	Effect			Effect	Positive Effect	Positive Effect
					Negative Effect	Negative Effect
Positive Feedback	Acceptance	Perception	Attitude	Perception	Positive Perception	Positive Attitude
Negative Feedback	Resistance				Negative Perception	Negative Attitude
Advice	Information	Knowledge	Information	Information	Knowledge	Knowledge
		Cause		Cause	Cause	Cause
		Problem Statement		Problem Statement	Problem Statement	
			Behaviour Change	Behaviour Change	Behaviour Change	Behaviour Change
			Self-identity	Self-identity	Self-identity	Self-identity
					Prevention	Prevention
Others	Others	Others	Others	Others	Others	

Source: Developed for the research

*Appendix 3.5.3.1: Definition of factors and subcategories*

1. Cause: Reasons that contribute to obesity and overweight.
  - **An Inactive Lifestyle (CIL):** is defined as a type of lifestyle where an individual does not receive regular amounts of physical activity.
  - **Genes and Family Factor (CG):** a unit of heredity that is transferred from a parent to offspring and is held to determine some characteristic of the offspring or a person is born into a family of overweight and obese people, he/she may be predisposed to the condition, given the behaviour of his/her parents.
  - **Health Conditions (CH):** refers to physical or mental condition of a person. For example, illness, injury, impairment that can cause obesity and overweight.
  - **Emotional Factors (CEF):** refers to state of feeling deriving from one's circumstances, mood, or relationships with others.
  - **Lack of Sleep (CLS):** the condition of not having enough sleep; or a person fails to obtain adequate duration of sleep.
  - **Unhealthy Diet (CU):** when a person fails to provide his/her body with the correct amounts and types of nutrients for maximum health or consuming any food that is not regarded as being conducive to maintaining health.
  - **Wealth Condition (CW):** the financial condition of a person, a person being rich or poor.
  - **Business Activities (CB):** including advertisements and promotions launched by profit organizations.
2. Positive Effect: Advantages and benefits of being obese and overweight.
  - **Physical (E+PH):** advantages and benefits are relating to one's body.
3. Negative Effect: Disadvantages, harms and dangers of being obese and overweight.
  - **Physical (E-PH):** harms and dangers are relating to one's body.
  - **Psychological (E-PS):** harms and dangers are relating to one's mind or mental health.
  - **Society (E-S):** harms and dangers are relating to others, people around or society at large.
4. Positive Attitude: Having a POSITIVE thought towards obesity and overweight.
  - **Cognitive Component (PAC):** Refers to the beliefs, thoughts, and attributes that we would associate with an object.

- **Affective Component (PAA):** Refers to the feelings or emotions linked to an attitude object.
  - **Behavioural Component (PAB):** Refers to past behaviours or experiences regarding an attitude object. The idea that people might infer their attitudes from their previous actions
5. Negative Attitude: Having a NEGATIVE thought towards obesity and overweight.
- **Cognitive Component (NAC):** Refers to the beliefs, thoughts, and attributes that we would associate with an object.
  - **Affective Component (NAA):** Refers to the feelings or emotions linked to an attitude object.
  - **Behavioural Component (NAB):** Refers to past behaviours or experiences regarding an attitude object. The idea that people might infer their attitudes from their previous actions
6. Knowledge: Information related to obesity and overweight.
- **Information of Obesity & Overweight (KI):** General information about obesity and overweight. It should not include causes and effects of obesity and overweight.
  - **Awareness of Obesity & Overweight (KA):** Having knowledge of obesity and overweight, aware of the problem of obesity and overweight or aware the difference between obesity and overweight.
7. Behaviour change: People recognize him/herself as obese or overweight and plan to take actions to change it.
- **Lifestyle (BL):** The transformations and modifications a person trying to make are relating to habits, attitudes, tastes and etc that constitute the mode of living of an individual.
  - **Exercise (BE):** Trying to increase the amount of physical activity to improve the current situation.
8. Prevention: Offering ways to prevent from or to cure obesity and overweight.
- **Physical (PVPH):** Methods of prevention are relating to one's body.
  - **Psychological (PVPS):** Methods of prevention are relating to one's mind.
  - **Society (PVS):** Methods of prevention are originated by some authorities and enforced in a society.
9. **Self-identity (S):** Describing current situations of one's body.



\_\_\_\_\_

The rating scale at the top ranges from -5 to +5. The rating scale may range from -3 to +3, -4 to +4 or -5 to +5. According to Brown (1980), most of the Q-methodological studies employ a rating scale of -5 to +5. In fact, design of rating scale depends on the number of statements in the Q-sample. A greater number of statements need a wider range. Since the number of statements in this study is considered large, rating scale of -5 to +5 is adopted. Despite of that, Brown (1980) stated that employing different ranges and distributions has no significant effect on the final results.

The kurtosis of the Q-sort diagram depends on the controversy of the topic. A steeper distribution is needed where the respondent's knowledge or interest is expected to be low in order to leave more rooms for ambiguity or indecisiveness (van Exel & de Graaf, 2005). Therefore, this study employs a steeper distribution as a small part of the statements may be beyond the knowledge of the respondents.

#### Sources:

Brown, S. R. (1980). *Political subjectivity: applications of Q methodology in political science*. New Haven: Yale University Press.

Van Exel, J., & de Graaf, G. (2005). *Q methodology: A sneak preview*. Retrieved from March 10, 2015, from <http://qmethod.org/articles/vanExel.pdf>.

*Appendix 3.7.2.2: Overview of Survey*



**UNIVERSITI TUNKU ABDUL RAHMAN**  
**FACULTY OF BUSINESS AND FINANCE**  
**PERAK CAMPUS**

Dear Participant

This study is being conducted by marketing students in partial satisfaction of the requirements for the Bachelor of Marketing (Hons) in the Faculty of Business and Finance of the University Tunku Abdul Rahman. This research aims to explore the knowledge, perception and misunderstanding of people toward obesity through major social media – Twitter.

We would greatly appreciate your completing the enclosed survey and returning it promptly after completing this survey. Since the validity of the results depends on surveying individuals who are social media users especially Twitter users, your participation is crucial to the success of this study. This survey will take approximately two hours to complete.

Please be assured that your responses will be held in the strictest confidential.

Thank you for taking the time to assist us in our research. The data collected will provide useful suggestions for future interventions and health promotion campaigns related to obesity.

Sincerely,

Chow Kim Teng

Chua Li Rou

Loo Mun Yee

Wong Paik Kei

## Overview of Interview

This interview consists of TWO main sections which are as follow:

### 1. Q-sorting exercise

- ✓ Please open the file named “*Q-sorting instructions*” and follow the steps to complete the Q-sorting exercise.
- ✓ Open the file named “*Q-sorting*” which is in a Microsoft Excel format to complete the Q-sorting exercise.

### 2. Questionnaire

- ✓ Open the file named “*Questionnaire*” to complete this section.
- ✓ The first part of the questionnaire contains questions related to the Q-sorting exercise.
- ✓ The second part contains questions related to demographic factors.

Appendix 3.7.2.3: Q-sorting instructions**Q-sorting Instructions**

- ✓ You should categorize the statements based on your viewpoints about the statements. 你要依自己的看法來進行分類。
- ✓ Please ensure that nobody is beside you so you can reflect your true viewpoints. 請確保沒有人在你身邊，所以你可以反映你的真實觀點。
- ✓ Please note that you are free to change your responses throughout the process. Also, there is no right or wrong way to sort the statements, the choices are subjectively yours and are inherently correct in any order. 在過程中，你可以任意的轉換答案。分類沒有對與錯，分類完全是依照你的看法來進行區分。

1. Read the statements in the Q-sample (1<sup>st</sup> sheet of “Q-sorting” Microsoft Excel file) and categorize the statements into 3 major groups which are AGREE, DISAGREE and NEUTRAL. 請清楚的明白每項 statement 再把它們歸類進 AGREE, DISAGREE 和 NEUTRAL。

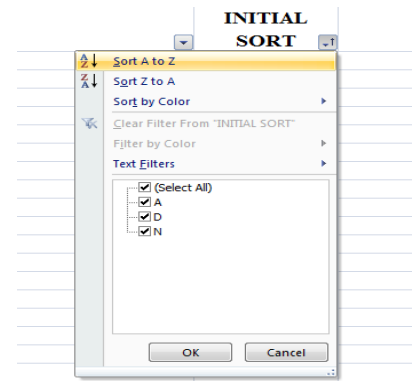
- a. Place “A” in the “**INITIAL SORT**” column to represent that you agree with the statement, “D” for disagreement and “N” for neutral. 請把 AGREE 的 statement 在 “INITIAL SORT” 欄裡標 “A”，DISAGREE 標 “D”，NEUTRAL 標 “N”。注：務必把所有 STATEMENT 分類完畢才繼續進行。

	Q-SAMPLE	INITIAL SORT
4		
5	(1) Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	A
6	(2) Study identifies childhood obesity as a risk factor for dropping out of school.	A
7	(3) Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.	D
8	(4) Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".	D
9	(5) Foods that are high in nickel are linked to obesity in some women.	N
10	(6) Plus Size Appreciation is not promoting obesity. It's making people who are constantly put down feel good about themselves.	N
11	(7) You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	
12	(8) Several new studies add to a body of evidence that being overweight may have health benefits.	
13	(9) Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.	
14	(10) When more people are dying from obesity than starvation, there is a big problem.	
15	(11) You see fat families? When the mum is obese. The dad is obese. And so are the kids? Sickening. They should be banned from public.	
16	(12) An anti-obesity law has passed in Japan. It's now illegal to be overweight or fat in Japan.	
17	(13) Training leg is painful especially when you are an overweight baby boomer. But I am going to do this.	
18	(14) Wealthier men have a higher rate of obesity than poor. Poor women have higher rate of obesity than wealthier women.	
19	(15) Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	
20	(16) Overweight type-2 diabetes patients outlive thinner ones, study says.	
21	(17) Teenagers who misperceive their weight as overweight are actually more likely to overeat compared to teenagers who accurately perceive their weight.	
22	(18) I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.	
23	(19) If you make fun an overweight person working out at the gym I'll key your vehicle.	

Until you have  
completed 76  
statements

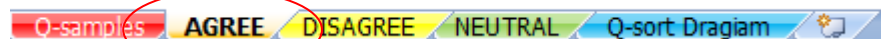


2. Sort the “**INITIAL SORT**” column. 請把 “**INITIAL SORT**”欄依照順序排列，以便進行以下活動。



- a. Now, **COPY** ALL the statements you are agreed with and paste them on the AGREE sheet (in orange colour). (Note: These are statements with “A” in the “**INITIAL SORT**” column) 請把所有標 “A”的 statement 複製並貼進 AGREE 篇頁裡

Q-SAMPLE		INITIAL SORT
4		
5	(1) Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	A
6	(2) Study identifies childhood obesity as a risk factor for dropping out of school.	A
7	(7) You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	A
8	(8) Several new studies add to a body of evidence that being overweight may have health benefits.	A
9	(9) Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.	A
10	(19) If you make fun an overweight person working out at the gym I'll key your vehicle.	A
11	(20) Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would want to be healthy.	A
12	(21) Lack of sleep is putting children at risk of overweight and obesity.	A
13	(22) Obese people may have lower dementia risk.	A
14	(23) Being overweight is unhealthy and it is your personal responsibility to do your best to become fit. Please do.	A
15	(24) People at a normal weight who believe they are fat have a much greater risk of becoming obese later in life.	A
16	(25) If I was getting overweight or obese, and my friends were telling me "Rock it girl!", "love yourself". I would get away from these people.	A
17	(38) I despise parents who say that it is not their fault that their child is overweight.	A
18	(40) 15 minutes of laughter everyday can help reduce your risk of obesity and boost your metabolism.	A
19	(42) Important reminder: not every overweight person dislikes their body and wants it to change!!! Do not project societal standards on others.	A
20	(44) I was once obese. Trust me, you're lying to yourself if you have the 'as long as I'm happy' mentality to justify your condition.	A
21	(46) 1-4 children in America are obese, but please keep telling me how bad cutting weight is for my body.	A
22	(51) I love this whole love your body movement, but if you are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.	A
23	(52) Pizza Hut offers free pizza to everyone called Charlotte this weekend, as a token of their devotion to childhood obesity.	A
24	(53) Seeing an overweight person working hard in the gym is very motivating for me.	A
25	(54) Obesity is a rich people problem.	A
26	(60) Parents rarely spot child obesity.	A
27	(61) I am overweight and this is nothing but facts. We should not promote unhealthy lifestyles.	A
28	(62) I used to tell myself I'm naturally overweight, I'm naturally big boned. But there are no fat people. Take Action!	A
29	(63) Obesity due to bad diet not lack of exercise.	A
30	(68) I was overweight but when I started doing gymnastics, I lost weight and I am not that skinny but confident.	A
31	(69) Obesity is a frequently overlooked factor that can contribute to an increased cancer risk.	A
32	(70) Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.	A
33	(3) Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.	D
34	(4) Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".	D
35	(10) When more people are dying from obesity than starvation, there is a big problem.	D

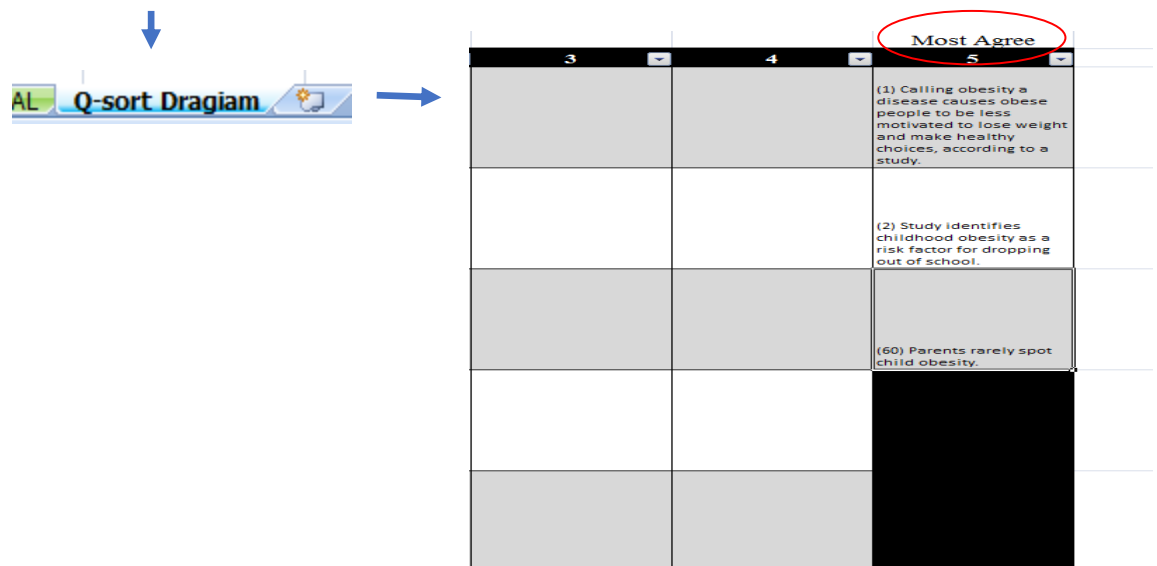
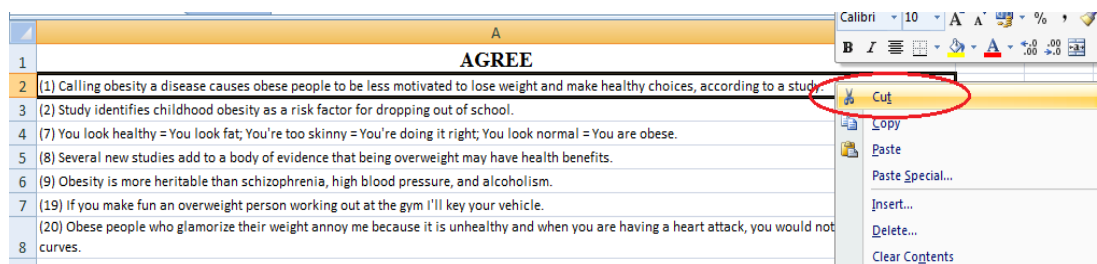


- b. Again, **COPY** and paste ALL the statements you are disagreed with on the DISAGREE sheet (in yellow). (Note: These are statements with “D” in the “**INITIAL SORT**” column) 請把所有標 “D”的 statement 複製並貼進 DISAGREE 篇頁裡。
- c. **COPY** and paste ALL the statements you are not sure with on the NEUTRAL sheet (in green). (Note: These are statements with “N” in the “**INITIAL SORT**” column) 請把所有標 “N”的 statement 複製並貼進 NEUTRAL 篇頁裡。

- d. Please be sure that the sum of the statements in AGREE, DISAGREE and NEUTRAL sheets is 76. 請確認三頁篇頁的 statement 總數是 76。以防有重複。

3. Take a look at the statements on AGREE sheet ONLY. 請只留意 AGREE 篇頁。

- a. You have to select 3 statements you are most agreed with and place them in the column labeled “5” on the sheet namely Q-sort Diagram (in blue colour). You should **CUT** (do not copy) and paste these 3 statements into the column labeled “5” in the Q-sort Diagram. (*At this stage, “5” column should be filled*) 請選 3 項你最認同的 statement，把它們剪出（請別複製）並貼在 “5” 欄裡。請確認 “5” 欄填滿再繼續進行。



- b. Next, among the remaining statements under AGREE sheet, select 5 statements you are more agreed with and **CUT** and paste these 5 statement into the “4” column in the Q-sort Diagram. (*At this stage, “4” column should be filled*) 請再選出 5 項比較認同的 statement，把它們剪出並貼在 “4” 欄裡。請確認 “4” 欄填滿再繼續進行。

- c. Now, check the number of remaining statements under the AGREE sheet. If you have 7 or more statements left under AGREE sheet, select 7 statements you are more agreed with and **CUT** and paste them into the “3” column. (*At this stage, “3” column should be filled*). In case where you have less than 7 statements left under the AGREE sheet, go to Step 4. 請確認 AGREE 篇頁的 statement 有 7 項或以上才進行此活動。請選出 7 項比較認同的 statement, 把他們剪出並貼在 “3” 欄裡。請確認 “3” 欄填滿再繼續進行。注: 如 AGREE 篇頁的 statement 少過 7 項, 請放空 “3” 欄, 直接進行 STEP 4。
  - d. Again, check the number of remaining statements under the AGREE sheet. If you have 8 or more statements left under AGREE sheet, select 8 statements you are more agreed with and **CUT** and paste them into the “2” column. (*At this stage, “2” column should be filled*). In case where you have less than 8 statements left under the AGREE sheet, go to Step 4. 請確認 AGREE 篇頁的 statement 有 8 項或以上才進行此活動。請選出 8 項比較認同的 statement, 把他們剪出並貼在 “2” 欄裡。請確認 “2” 欄填滿再繼續進行。注: 如 AGREE 篇頁的 statement 少過 8 項, 請放空 “2” 欄, 直接進行 STEP 4。
4. Ignore the AGREE sheet for now. Switch your attention to the statements under DISAGREE sheet ONLY. 請只注意 DISAGREE 篇頁。
    - a. You have to select 3 statements you are most disagreed with and place them under the “-5” columns. You should **CUT** and paste these 3 statements into the “-5” columns in the Q-sort Diagram. (*At this stage, “-5” column should be filled*) 請選 3 項你最不認同的 statement, 把它們剪出並貼在 “-5” 欄裡。請確認 “-5” 欄填滿再繼續進行。
    - b. Next, among the remaining statements under DISAGREE sheet, select 5 statements you are more disagreed with and **CUT** and paste these 5 statement into the “-4” column in the Q-sort Diagram. (*At this stage, “-4” column should be filled*) 請選 5 項比較不認同的 statement, 把它們剪出並貼在 “-4” 欄裡。請確認 “-4” 欄填滿再繼續進行。
    - c. Now, check the number of remaining statements under the DISAGREE sheet. If you have 7 or more statements left under DISAGREE sheet, select 7 statements you are more disagreed with and **CUT** and paste them into the “-3” column. (*At this stage, “-3” column should be filled*). In case where you have less than 7 statements left under the DISAGREE sheet, go to Step 5. 請確認 DISAGREE 篇頁的 statement 有 7 項或以上才進行此活動。請



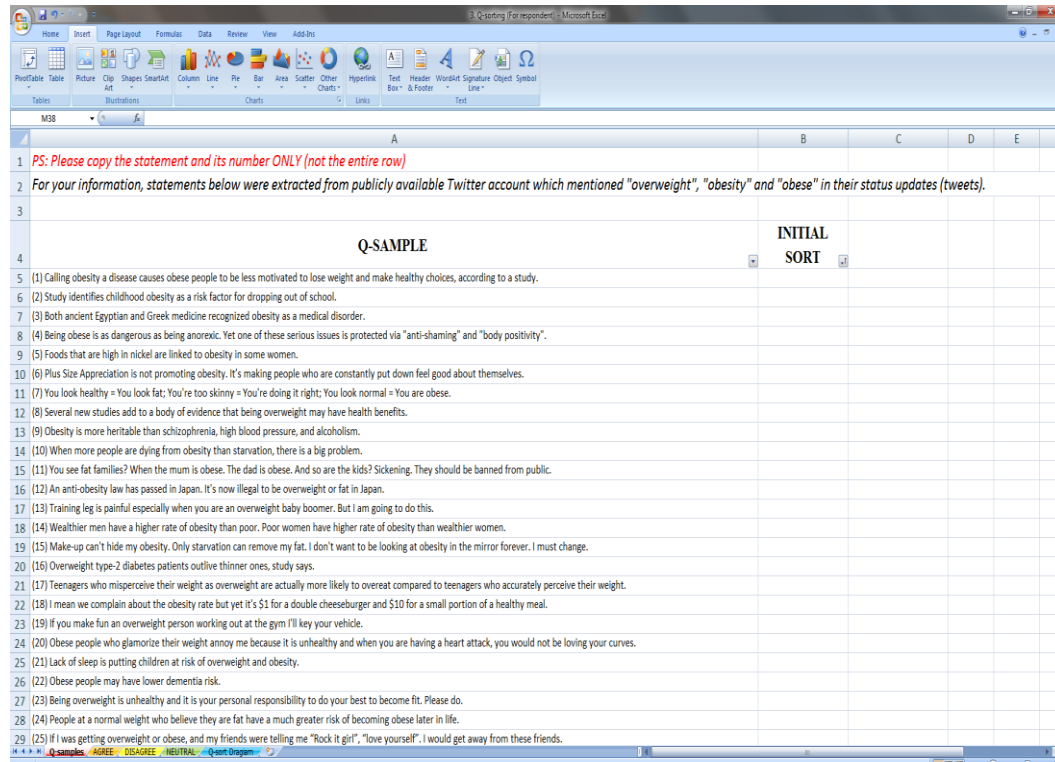
- 選出 7 項比較不認同的 statement，把他們剪出並貼在“-3”欄裡。請確認“-3”欄填滿再繼續進行。注：如 DISAGREE 篇頁的 statement 少過 7 項，請放空“-3”欄，直接進行 STEP 5。
- d. Again, check the number of remaining statements under the DISAGREE sheet. If you have 8 or more statements left under DISAGREE sheet, select 8 statements you are more disagreed with and CUT and paste them into the“-2” column. (*At this stage, “-2” column should be filled*). In case where you have less than 8 statements left under the DISAGREE sheet, go to Step 5. 請確認 DISAGREE 篇頁的 statement 有 8 項或以上才進行此活動。請選出 8 項比較不認同的 statement，把他們剪出並貼在“-2”欄裡。請確認“-2”欄填滿再繼續進行。注：如 DISAGREE 篇頁的 statement 少過 8 項，請放空“-2”欄，直接進行 STEP 5。
5. Put all the remaining statements left in the AGREE and DISAGREE sheets into the NEUTRAL sheet. You can do so by CUTTING the remaining statements in the AGREE and DISAGREE sheets and pasting them on the NEUTRAL sheet. 請把剩下在 AGREE 和 DISAGREE 篇頁裡的 statement 剪出（請別複製）並貼在 NEUTRAL 篇頁。
- a. *Ignore this and go to the “b” below if your “3” column has been filled.* IF your “3” column has NOT been filled yet, among the statements under NEUTRAL sheet, select 7 statements which you are more agreed with and CUT and paste them into “3” column. (*At this stage, “3” column should be filled*) 如“3”欄已經填滿，請忽略此活動，直接跳去 b。請選出 7 項比較認同的 statement，剪出並貼在“3”欄。請確認“3”欄填滿才繼續進行。
- b. *Ignore this and go to the “c” below if your “2” column has been filled.* Select 8 statements which you are more agreed with and CUT and place them into “2” column. (*At this stage, “2” column should be filled*) 如“2”欄已經填滿，請忽略此活動，直接跳去 c。請選出 8 項比較認同的 statement，剪出並貼在“2”欄。請確認“2”欄填滿才繼續進行。
- c. Select 9 statements you are more agreed with and CUT and paste them into the “1” column. (*At this stage, “1” column should be filled*) 請選出 9 項比較認同的 statement，剪出並貼在“1”欄裡。請確認“1”欄填滿才繼續進行。
- d. *Ignore this and go to the “e” below if your “-3” column has been filled.* Select 7 statements which you are more disagreed with and CUT and paste them into“-3” column. (*At this stage, “-3” column should be filled*) 如“-3”欄已經填滿，請忽略此活動，直接跳去 e。請選出 7 項比較不認同的 statement，剪出並貼在“-3”欄。請確認“-3”欄填滿才繼續進行。

- e. *Ignore this and go to the “f” below if your “-2” column has been filled. Select 8 statements which you are more disagreed with and CUT and paste them into “-2” column. (At this stage, “-2” column should be filled)* 如“-2”欄已經填滿，請忽略此活動，直接跳去 f。請選出 8 項比較不認同的 statement，剪出並貼在“-2”欄。請確認“-2”欄填滿才繼續進行。
  - f. *Select 9 statements you are more disagreed with and CUT and paste them into the “-1” column. (At this stage, “-1” column should be filled)* 請選出 9 項比較不認同的 statement，剪出並貼在“-1”欄裡。請確認“-1”欄填滿才繼續進行。
  - g. *Now, there should have 12 statements left in the NEUTRAL sheet. CUT and paste them into the “0” column. (At this stage, “0” column should be filled)* 請把剩下的 12 項剪出並貼在“0”欄裡。  
注：在“0”欄填滿後，AGREE，DISAGREE 和 NEUTRAL 篇頁沒有剩下任何 statement。
6. Now, take a look at the Q-sort Diagram. You are free to change the placement of the statements in the Q-sort Diagram. Please be sure that the placement of the statements in the Q-sort Diagram can represent your viewpoints. *(At this stage, all the cells in the Q-sort Diagram should be filled)* 你可以任意更換答案但確保所有答案是你個人看法。請再次確認 Q-SORT DIAGRAM 已被填滿並沒有任何重複 statement。
7. Once you are satisfied with the result on the Q-sort Diagram, save the file and send a copy of it to us. 如沒有任何更改或錯誤，請將此文件存檔並把完整答案發回給我們。

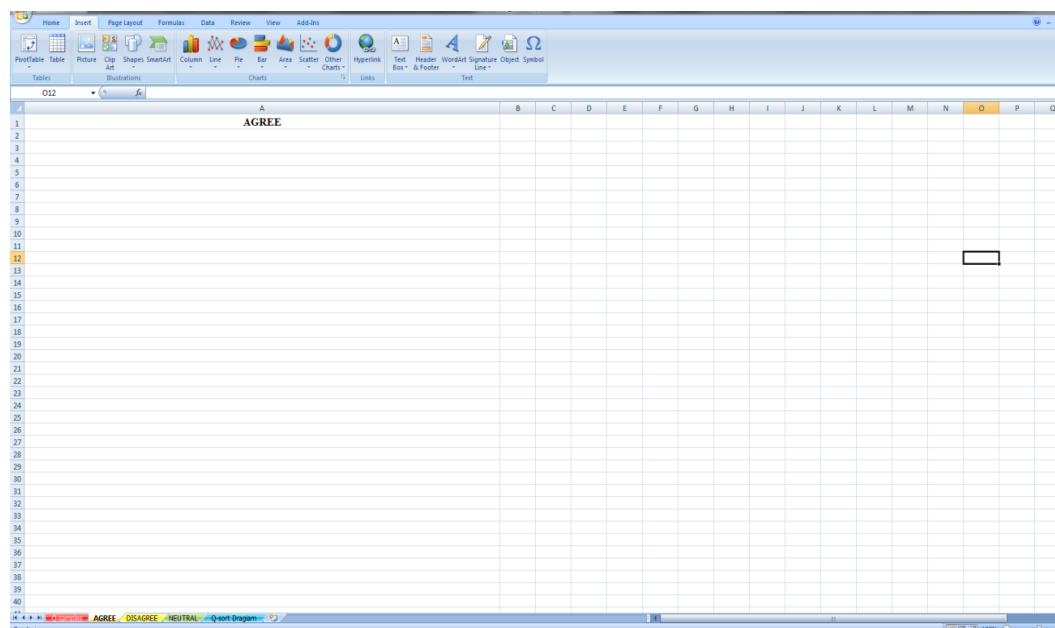
**Sincerely thank you for your time and participating this Q-sorting exercise.**

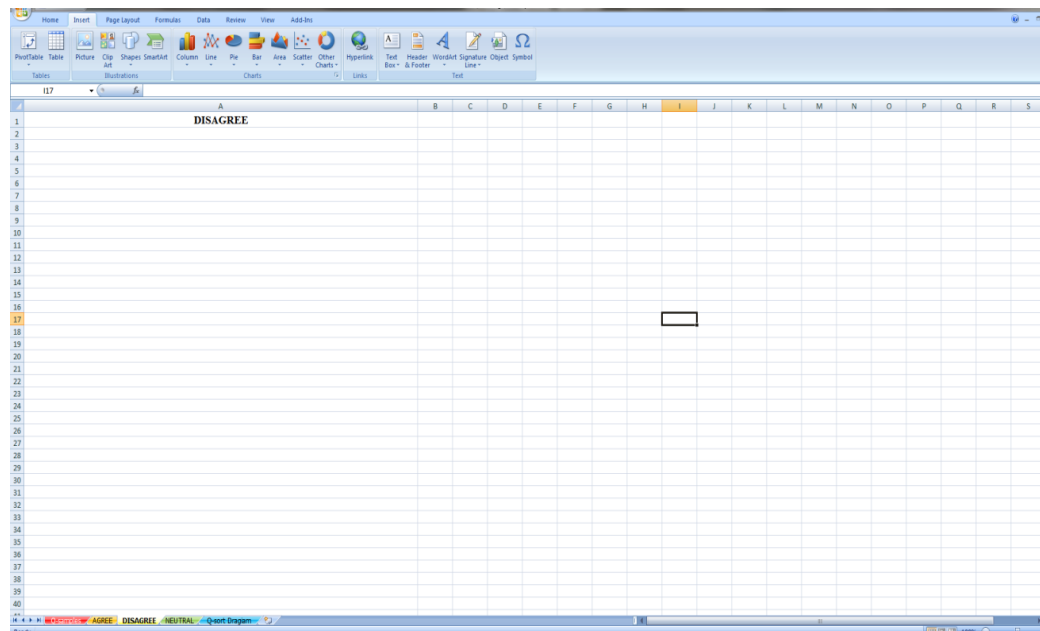
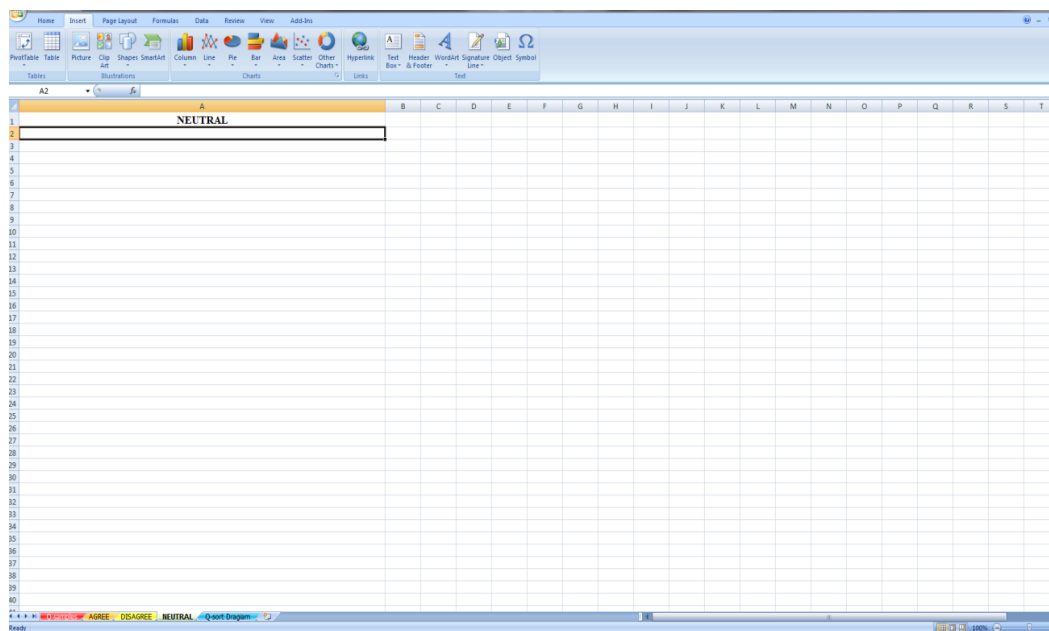
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### Appendix 3.7.2.4: Sheet 1 - Q-statements

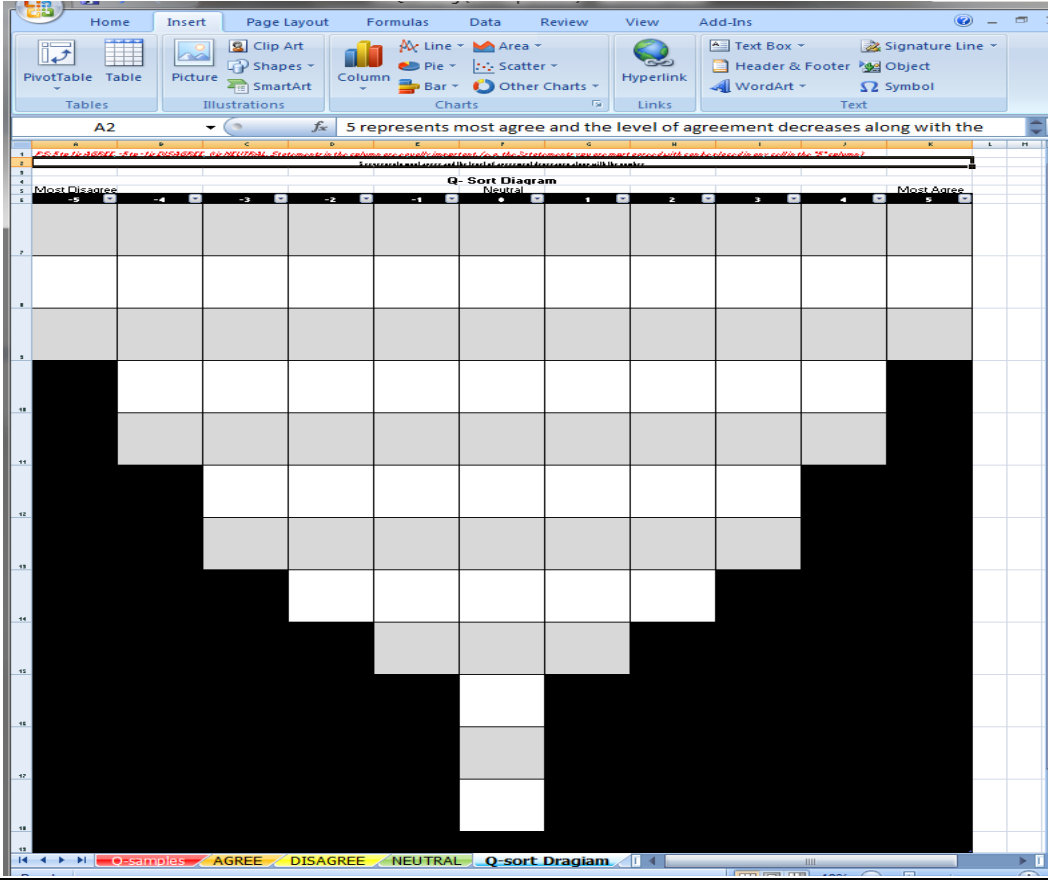


### Appendix 3.7.2.5: Sheet 2 – Agree Sheet



Appendix 3.7.2.6: Sheet 3 – Disagree SheetAppendix 3.7.2.7: Sheet 4 – Neutral Sheet

Appendix 3.7.2.8: Sheet 5 – Q-sort Diagram



Appendix 3.7.2.9: Q-Sample Questionnaire

**QUESTIONNAIRE**

**PART I – Post-sort Questions**

1. Please explain why you agree most with the THREE statements you have placed below column labeled “5”.

(Statement number:     ): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Statement number:     ): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Statement number:     ): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Please explain why you disagree most with the THREE statements you have placed below column labeled “- 5”.

(Statement number:     ): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Statement number:     ): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Statement number:     ): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **PART II - Demographic Questionnaire**

Please highlight the answers that best apply to you in each item.

1. Please state your age.

- ☐ 20 or under
- ☐ 21-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51 or above

2. Please state your gender.

- ☐ Male
- ☐ Female

3. Please state your race.

- ☐ Malay
- ☐ Chinese
- ☐ Indian
- ☐ Others. Please specify: \_\_\_\_\_

4. Please state your highest education completed.

- ☐ Secondary School
- ☐ STPM / A- Level / Foundation
- ☐ Diploma / Advance Diploma
- ☐ Bachelor Degree
- ☐ Master Degree
- ☐ PhD (Doctorate)
- ☐ Others. Please specify: \_\_\_\_\_

5. Please specify your occupation.

---

6. Do you have a Twitter account?

☐ Yes.

☐ No.

**Thank you for your precious time and cooperation in completing this  
questionnaire.**

**All responses will be kept private and confidential.**



Appendix 3.7.2.10: Process of Q-sorting

In the Q-sorting, participants were first given the condition of instructions which asked the respondents to sort the statements based on their personal viewpoints. After condition of instructions had been given, respondents were instructed to sort the statements into three main categories which are “Agree”, “Disagree” and “Neutral” and this process is called initial sort.

Upon completion of initial sort, respondents were asked to focus on the statements in the “Agree” category and select three statements which they most agreed with and place these statements in the column labelled “+5” in the Q-sort diagram. On the remaining statements under “Agree” categories, respondents were asked to select five statements which they more agreed with in order to fill the columns labelled “+4”. This process continues to fill the columns “+3” and “+2” if the respondents have enough statements in the “Agree” category to put under these columns. When respondents have successfully filled all the columns mentioned above, they were asked to switch their attentions to the “Disagree” category.

If respondents have insufficient statements to fill the column of “+3” or perhaps “+2”, in this case, respondents were asked to switch their attentions to the “Disagree” category as well. Same procedure applies here to sort the statements in “Disagree” category. Respondents were asked to select three statements which they most disagreed with and place these statements in the “-5” column. This continues to fill columns labelled “-4”, “-3” and “-2”. When respondents have successfully filled all the columns mentioned, they were asked to switch their attentions to the “Neutral” category.

If respondents have insufficient statements to fill the column of “-3” or perhaps “-2”, respondents were asked to switch their attentions to the “Neutral” category as well. Meanwhile, respondents were asked to put all the remaining statements in “Agree” and “Disagree” categories into “Neutral” category and review these

statements as a group. Participants were asked to select the statements that they either agreed with or disagree with more than the statements that remained unplaced. Respondents were instructed that the agreement or disagreement on statements was relative in the sense that they may not actually agree with the statements they place under agree side (e.g. “+1” column) yet rather simply disagree with them less than other remaining statements. At the end of the Q-sorting, the remaining 12 statements were placed in the “0” column.

On completion of the Q-sorting, respondents were asked to look at the Q-sort diagram and if it can represent their viewpoints. Respondents were free to change the placement of the statement if they want to. Once the respondents were satisfied with the placements on the Q-sort diagram, they were asked why they agreed and disagreed with the statements they placed under “+5” and “-5” columns as well as asked to provide their general personal information.

*Appendix 4.4.1: Correlation Matrix Between Sorts*

SORTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 1.	100	32	16	34	13	14	10	15	13	25	3	26	22	23	16	26	27	12	32	13	33
2 2.	32	100	38	26	19	15	31	34	33	48	16	42	29	38	14	34	60	42	57	30	39
3 3.	16	38	100	39	29	16	27	43	26	43	-22	45	47	22	18	33	29	28	30	36	24
4 4.	34	26	39	100	17	36	30	45	36	47	-25	37	44	33	25	39	38	20	27	33	44
5 5.	13	19	29	17	100	11	4	22	13	20	-10	8	17	-12	22	11	22	8	20	32	37
6 6.	14	15	16	36	11	100	1	21	17	26	-15	27	20	11	26	17	-1	1	12	27	33
7 7.	10	31	27	30	4	1	100	46	69	40	8	11	38	44	13	29	44	38	20	23	33
8 8.	15	34	43	45	22	21	46	100	50	51	-5	29	40	28	14	41	41	28	43	47	36
9 9.	13	33	26	36	13	17	69	50	100	32	8	24	36	29	5	30	39	42	21	25	39
10 10.	25	48	43	47	20	26	40	51	32	100	-24	45	41	38	26	46	41	31	48	33	43
11 11.	3	16	-22	-25	-10	-15	8	-5	8	-24	100	-12	-9	-10	10	3	11	1	-5	-1	15
12 12.	26	42	45	37	8	27	11	29	24	45	-12	100	30	43	29	23	25	30	28	20	32
13 13.	22	29	47	44	17	20	38	40	36	41	-9	30	100	40	27	29	47	27	20	39	40
14 14.	23	38	22	33	-12	11	44	28	29	38	-10	43	40	100	27	29	34	31	25	11	35
15 15.	16	14	18	25	22	26	13	14	5	26	10	29	27	27	100	23	12	10	13	-6	37
16 16.	26	34	33	39	11	17	29	41	30	46	3	23	29	29	23	100	34	39	55	37	45
17 17.	27	60	29	38	22	-1	44	41	39	41	11	25	47	34	12	34	100	40	46	42	39
18 18.	12	42	28	20	8	1	38	28	42	31	1	30	27	31	10	39	40	100	40	34	21
19 19.	32	57	30	27	20	12	20	43	21	48	-5	28	20	25	13	55	46	40	100	41	35
20 20.	13	30	36	33	32	27	23	47	25	33	-1	20	39	11	-6	37	42	34	41	100	36
21 21.	33	39	24	44	37	33	33	36	39	43	15	32	40	35	37	45	39	21	35	36	100

*Appendix 4.4.2: Unrotated Factor Matrix*

Sorts	Factor					
	1	2	3	4	5	6
1.	0.3781	-0.0893	0.0608	0.1892	-0.0395	0.0646
2.	0.6345	0.2060	0.1734	0.2793	-0.2189	-0.1286
3.	0.5981	-0.1175	-0.1580	-0.1180	-0.0877	-0.3218
4.	0.6525	-0.2318	-0.0618	-0.0970	0.0895	0.1024
5.	0.3195	-0.0781	-0.1837	0.2167	0.2759	-0.2405
6.	0.3383	-0.3070	-0.1247	0.0611	0.1573	0.1459
7.	0.5537	0.3526	0.3042	-0.4579	0.1636	0.1377
8.	0.6556	0.1467	-0.1875	-0.1887	0.1397	0.0734
9.	0.5598	0.2903	0.1749	-0.2573	0.2273	0.0369
10.	0.7222	-0.0503	-0.0898	-0.0430	-0.1233	0.0552
11.	-0.1129	0.4270	0.4563	0.4148	0.2908	0.0182
12.	0.5544	-0.2763	0.1208	0.0375	-0.2864	-0.0527
13.	0.6190	-0.1084	0.0921	-0.1603	0.1418	-0.1551
14.	0.5370	-0.0689	0.4331	-0.1608	-0.2601	0.0894
15.	0.3422	-0.3666	0.2079	0.1855	0.0842	0.1637
16.	0.5950	0.1233	-0.0949	0.1151	-0.0567	0.2615
17.	0.6260	0.2836	0.1569	0.0331	0.0102	-0.2045
18.	0.5015	0.3338	0.0859	0.0080	-0.1613	-0.1183
19.	0.6292	0.3236	-0.2724	0.3632	-0.3162	0.1686
20.	0.5447	0.1911	-0.3404	0.1054	0.2123	-0.2268
21.	0.6623	-0.1298	0.1595	0.3038	0.3991	0.1668
Eigenvalues	6.3543	1.2256	0.9969	1.0103	0.8301	0.5365
% Expl. Var.	30	6	5	5	4	3

*Appendix 4.5.1: Normalized Factor Scores for Factor I*

No.	Statement Number	Statement	Z-scores
1.	23	Being overweight is unhealthy and it is your personal responsibility to do your best to become fit. Please do.	2.041
2.	18	I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.	1.897
3.	36	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	1.825
4.	27	Fat is harmful and obesity should not be a badge of pride.	1.705
5.	32	Being overweight is not healthy so I do not understand why people are arguing that 'plus size models' should be in the public eye.	1.561
6.	6	Plus Size Appreciation is not promoting obesity. It's making people who are constantly put down feel good about themselves.	1.489
7.	20	Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would not be loving your curves.	1.489
8.	15	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	1.417
9.	53	Seeing an overweight person working hard in the gym is very motivating for me.	1.225
10.	63	Obesity due to bad diet not lack of exercise.	1.225
11.	61	I am overweight and this is nothing but facts. We should not promote unhealthy lifestyles.	1.081
12.	64	You think I haven't tried to lose weight? Ask most overweight women and they have tried it is not as black and white as you may think.	1.081
13.	68	I was overweight but when I started doing gymnastics, I lost weight and I am not that skinny but confident.	1.081
14.	73	I admire an overweight person in the gym trying to get right. I was once there, my friends.	1.08
15.	33	Stop promoting being morbidly obese as beautiful. You wouldn't do it with anorexia, it's not beautiful. It's a death sentence.	1.009
16.	35	I am totally against fat shaming, but do not tell people that it is great and okay to be obese or overweight.	0.961
17.	47	I'm sorry but the people who embrace obesity only do so because they're too lazy to fix it.	0.816
18.	62	I used to tell myself I'm naturally overweight, I'm naturally big boned. But there are no fat people. Take	0.744

		Action!	
19.	38	I despise parents who say that it is not their fault that their child is overweight.	0.672
20.	65	Overweight prevalence of pre-school children in ASEAN. It is alarming!!!	0.624
21.	71	Being the highest percentage of obese people in South East Asia is not helping in our progress for a better Malaysia. Pondering times.	0.624
22.	42	Important reminder: not every overweight person dislikes their body and wants it to change!!! Do not project societal standards on us!!!	0.600
23.	48	Reduced stress level can help obese people to lose weight.	0.600
24.	13	Training leg is painful especially when you are an overweight baby boomer. But I am going to do this.	0.528
25.	39	Studies suggest standing more could lower risk for obesity, illness, and death.	0.480
26.	40	15 minutes of laughter everyday can help reduce your risk of obesity and boost your metabolism.	0.480
27.	70	Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.	0.480
28.	17	Teenagers who misperceive their weight as overweight are actually more likely to overeat compared to teenagers who accurately perceive their weight.	0.456
29.	69	Obesity is a frequently overlooked factor that can contribute to an increased cancer risk.	0.360
30.	3	Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.	0.336
31.	19	If you make fun an overweight person working out at the gym I'll key your vehicle.	0.336
32.	60	Parents rarely spot child obesity.	0.288
33.	4	Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".	0.264
34.	9	Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.	0.216
35.	56	Physical inactivity is a bigger risk factor for early death than "Smokadiabesity" (smoking, diabetes and obesity together).	0.120
36.	26	Eating micronutrient or fiber-rich bar two times per day increase metabolism and decrease inflammation in obese people without diet change.	-0.000
37.	46	1-4 children in America are obese, but please keep telling me how bad cutting weight is for my body.	-0.000
38.	34	Hyperinsulinemia drives diet-induced obesity independently of brain insulin production.	-0.000
39.	51	I love this whole love your body movement, but if you	-0.048

		are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.	
40.	30	I can say this because I was obese. I've been there and made all the excuses! Stop mollicoddling people & promote healthy lifestyle change!	-0.072
41.	14	Wealthier men have a higher rate of obesity than poor. Poor women have higher rate of obesity than wealthier women.	-0.072
42.	66	I've met a few people who say they don't like the taste of water. They were all obese. I assume it's correlated.	- 0.0120
43.	16	Overweight type-2 diabetes patients outlive thinner ones, study says.	-0.144
44.	5	Foods that are high in nickel are linked to obesity in some women.	-0.144
45.	22	Obese people may have lower dementia risk.	-0.144
46.	50	One way to lose weight? Studies show obesity is lower in marijuana users than in non-users.	-0.216
47.	43	No respect for people attacking overweight people at the gym who are trying to turn their life around.	-0.336
48.	31	Dr. Allen Litcher: "Obesity will likely surpass smoking as the leading preventable cause of cancer."	-0.408
49.	37	Every time my dad sees an overweight person & says "Look at that fat fuxx." saves me from letting my weight get out of control.	-0.480
50.	58	A new study shows many overweight people have a distorted self-image. They tell themselves, I'm not fat. I'm just easy to see.	-0.480
51.	67	Obesity is becoming a real problem in the United Kingdom.	-0.528
52.	28	I'm apparently overweight but I look good? Strange.	-0.552
53.	44	I was once obese. Trust me, you're lying to yourself if you have the 'as long as I'm happy' mentality to justify your condition.	-0.600
54.	72	For each hour of sleep lost, the odds of an adolescent being obese rise by 80%.	-0.600
55.	74	Overweight teen tries to defend himself: I have a slow metabolism. I'm a nervous eater. I'm related to RubeusHagrid (character in Harry Potter, who is a giant human).	-0.600
56.	52	Pizza Hut offers free pizza to everyone called Charlotte this weekend, as a token of their devotion to childhood obesity.	-0.624
57.	12	An anti-obesity law has passed in Japan. It's now illegal to be overweight or fat in Japan.	-0.624
58.	75	I hate when I go shopping and I can't find sizes for overweight people, it's so difficult to find and when you find something it's horrible.	-0.744
59.	41	4 out of 5 firefighters in US are overweight or obese, and about half of firefighters killed in the line of duty	-0.793

		suffer heart attacks.	
60.	45	I'm: So stressed. So depressed. So obese. So exhausted. So fat. So ugly. So worthless. So unwanted. So disappointing. So disgusting.	-0.816
61.	59	Everyone is getting skinny and I am getting obese.	-0.816
62.	55	Standing desks are coming to schools, to cure obesity and increase attention spans.	-0.889
63.	1	Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	-1.009
64.	24	People at a normal weight who believe they are fat have a much greater risk of becoming obese later in life.	-1.009
65.	29	McDonald's targets children to ensure that future generations grow up obese and lethargic.	-1.009
66.	76	Watching too much television can cause kids to be overweight and obese.	-1.297
67.	10	When more people are dying from obesity than starvation, there is a big problem.	-1.345
68.	8	Several new studies add to a body of evidence that being overweight may have health benefits.	-1.369
69.	54	Obesity is a rich people problem.	-1.369
70.	21	Lack of sleep is putting children at risk of overweight and obesity.	-1.417
71.	49	A salon owner claims that obese staff ruined her business by sneaking out for takeaways.	-1.561
72.	25	If I was getting overweight or obese, and my friends were telling me "Rock it girl", "love yourself". I would get away from these friends.	-1.561
73.	2	Study identifies childhood obesity as a risk factor for dropping out of school.	-1.633
74.	7	You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	-1.753
75.	57	The government were saying that, they might implement an obesity tax, as a scheme to battle obesity.	-1.969
76.	11	You see fat families? When the mum is obese. The dad is obese. And so are the kids? Sickening. They should be banned from public.	-2.041



*Appendix 4.5.2: Normalized Factor Scores for Factor II*

No.	Statement Number	Statement	Z-scores
1.	1	Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	1.930
2.	23	Being overweight is unhealthy and it is your personal responsibility to do your best to become fit. Please do.	1.915
3.	63	Obesity due to bad diet not lack of exercise.	1.770
4.	43	No respect for people attacking overweight people at the gym who are trying to turn their life around.	1.717
5.	48	Reduced stress level can help obese people to lose weight.	1.485
6.	70	Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.	1.269
7.	75	I hate when I go shopping and I can't find sizes for overweight people, it's so difficult to find and when you find something it's horrible.	1.163
8.	10	When more people are dying from obesity than starvation, there is a big problem.	1.146
9.	39	Studies suggest standing more could lower risk for obesity, illness, and death.	1.092
10.	42	Important reminder: not every overweight person dislikes their body and wants it to change!!! Do not project societal standards on us!!!	1.004
11.	60	Parents rarely spot child obesity.	1.002
12.	21	Lack of sleep is putting children at risk of overweight and obesity.	0.984
13.	6	Plus Size Appreciation is not promoting obesity. It's making people who are constantly put down feel good about themselves.	0.966
14.	9	Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.	0.856
15.	13	Training leg is painful especially when you are an overweight baby boomer. But I am going to do this.	0.822
16.	69	Obesity is a frequently overlooked factor that can contribute to an increased cancer risk.	0.787
17.	55	Standing desks are coming to schools, to cure obesity and increase attention spans.	0.753
18.	40	15 minutes of laughter everyday can help reduce your risk of obesity and boost your metabolism.	0.752
19.	47	I'm sorry but the people who embrace obesity only do so because they're too lazy to fix it.	0.734
20.	4	Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-	0.714

		shaming" and "body positivity".	
21.	72	For each hour of sleep lost, the odds of an adolescent being obese rise by 80%.	0.695
22.	73	I admire an overweight person in the gym trying to get right. I was once there, my friends.	0.681
23.	17	Teenagers who misperceive their weight as overweight are actually more likely to overeat compared to teenagers who accurately perceive their weight.	0.677
24.	34	Hyperinsulinemia drives diet-induced obesity independently of brain insulin production.	0.660
25.	66	I've met a few people who say they don't like the taste of water. They were all obese. I assume it's correlated.	0.627
26.	53	Seeing an overweight person working hard in the gym is very motivating for me.	0.539
27.	58	A new study shows many overweight people have a distorted self-image. They tell themselves, I'm not fat. I'm just easy to see.	0.517
28.	65	Overweight prevalence of pre-school children in ASEAN. It is alarming!!!	0.447
29.	3	Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.	0.428
30.	27	Fat is harmful and obesity should not be a badge of pride.	0.395
31.	33	Stop promoting being morbidly obese as beautiful. You wouldn't do it with anorexia, it's not beautiful. It's a death sentence.	0.341
32.	22	Obese people may have lower dementia risk.	0.322
33.	56	Physical inactivity is a bigger risk factor for early death than "Smokadiabesity" (smoking, diabetes and obesity together).	0.287
34.	44	I was once obese. Trust me, you're lying to yourself if you have the 'as long as I'm happy' mentality to justify your condition.	0.252
35.	14	Wealthier men have a higher rate of obesity than poor. Poor women have higher rate of obesity than wealthier women.	0.233
36.	16	Overweight type-2 diabetes patients outlive thinner ones, study says.	0.160
37.	51	I love this whole love your body movement, but if you are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.	0.124
38.	67	Obesity is becoming a real problem in the United Kingdom.	0.107
39.	68	I was overweight but when I started doing gymnastics, I lost weight and I am not that skinny but confident.	0.053
40.	28	I'm apparently overweight but I look good? Strange.	0.017

41.	41	4 out of 5 firefighters in US are overweight or obese, and about half of firefighters killed in the line of duty suffer heart attacks.	0.000
42.	18	I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.	-0.017
43.	36	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	-0.019
44.	38	I despise parents who say that it is not their fault that their child is overweight.	-0.032
45.	12	An anti-obesity law has passed in Japan. It's now illegal to be overweight or fat in Japan.	-0.054
46.	31	Dr. Allen Litcher: "Obesity will likely surpass smoking as the leading preventable cause of cancer."	-0.073
47.	30	I can say this because I was obese. I've been there and made all the excuses! Stop molycoddling people & promote healthy lifestyle change!	-0.125
48.	64	You think I haven't tried to lose weight? Ask most overweight women and they have tried it is not as black and white as you may think.	-0.180
49.	71	Being the highest percentage of obese people in South East Asia is not helping in our progress for a better Malaysia. Pondering times.	-0.215
50.	59	Everyone is getting skinny and I am getting obese.	-0.216
51.	5	Foods that are high in nickel are linked to obesity in some women.	-0.357
52.	62	I used to tell myself I'm naturally overweight, I'm naturally big boned. But there are no fat people. Take Action!	-0.466
53.	24	People at a normal weight who believe they are fat have a much greater risk of becoming obese later in life.	-0.482
54.	26	Eating micronutrient or fiber-rich bar two times per day increase metabolism and decrease inflammation in obese people without diet change.	-0.516
55.	49	A salon owner claims that obese staff ruined her business by sneaking out for takeaways.	-0.519
56.	46	1-4 children in America are obese, but please keep telling me how bad cutting weight is for my body.	-0.588
57.	45	I'm: So stressed. So depressed. So obese. So exhausted. So fat. So ugly. So worthless. So unwanted. So disappointing. So disgusting.	-0.591
58.	8	Several new studies add to a body of evidence that being overweight may have health benefits.	-0.611
59.	61	I am overweight and this is nothing but facts. We should not promote unhealthy lifestyles.	-0.734

60.	20	Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would not be loving your curves.	-0.822
61.	74	Overweight teen tries to defend himself: I have a slow metabolism. I'm a nervous eater. I'm related to RubeusHagrid (character in Harry Potter, who is a giant human).	-0.894
62.	7	You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	-1.019
63.	35	I am totally against fat shaming, but do not tell people that it is great and okay to be obese or overweight.	-1.036
64.	57	The government were saying that, they might implement an obesity tax, as a scheme to battle obesity.	-1.108
65.	52	Pizza Hut offers free pizza to everyone called Charlotte this weekend, as a token of their devotion to childhood obesity.	-1.127
66.	15	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	-1.215
67.	32	Being overweight is not healthy so I do not understand why people are arguing that 'plus size models' should be in the public eye.	-1.234
68.	50	One way to lose weight? Studies show obesity is lower in marijuana users than in non-users.	-1.395
69.	29	McDonald's targets children to ensure that future generations grow up obese and lethargic.	-1.414
70.	76	Watching too much television can cause kids to be overweight and obese.	-1.487
71.	19	If you make fun an overweight person working out at the gym I'll key your vehicle.	-1.574
72.	2	Study identifies childhood obesity as a risk factor for dropping out of school.	-1.860
73.	25	If I was getting overweight or obese, and my friends were telling me "Rock it girl", "love yourself". I would get away from these friends.	-2.002
74.	54	Obesity is a rich people problem.	-2.037
75.	37	Every time my dad sees an overweight person & says "Look at that fat fuxx." saves me from letting my weight get out of control.	-2.056
76.	11	You see fat families? When the mum is obese. The dad is obese. And so are the kids? Sickening. They should be banned from public.	-2.342

*Appendix 4.5.3: Normalized Factor Scores for Factor III*

No.	Statement Number	Statement	Z-scores
1.	23	Being overweight is unhealthy and it is your personal responsibility to do your best to become fit. Please do.	1.805
2.	51	I love this whole love your body movement, but if you are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.	1.805
3.	67	Obesity is becoming a real problem in the United Kingdom.	1.690
4.	10	When more people are dying from obesity than starvation, there is a big problem.	1.628
5.	43	No respect for people attacking overweight people at the gym who are trying to turn their life around.	1.628
6.	53	Seeing an overweight person working hard in the gym is very motivating for me.	1.628
7.	35	I am totally against fat shaming, but do not tell people that it is great and okay to be obese or overweight.	1.513
8.	27	Fat is harmful and obesity should not be a badge of pride.	1.398
9.	73	I admire an overweight person in the gym trying to get right. I was once there, my friends.	1.336
10.	13	Training leg is painful especially when you are an overweight baby boomer. But I am going to do this.	1.221
11.	42	Important reminder: not every overweight person dislikes their body and wants it to change!!! Do not project societal standards on us!!!	1.221
12.	71	Being the highest percentage of obese people in South East Asia is not helping in our progress for a better Malaysia. Pondering times.	1.221
13.	47	I'm sorry but the people who embrace obesity only do so because they're too lazy to fix it.	1.106
14.	72	For each hour of sleep lost, the odds of an adolescent being obese rise by 80%.	1.044
15.	33	Stop promoting being morbidly obese as beautiful. You wouldn't do it with anorexia, it's not beautiful. It's a death sentence.	0.991
16.	6	Plus Size Appreciation is not promoting obesity. It's making people who are constantly put down feel good about themselves.	0.814
17.	70	Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.	0.814
18.	61	I am overweight and this is nothing but facts. We should not promote unhealthy lifestyles.	0.760
19.	32	Being overweight is not healthy so I do not	0.699

		understand why people are arguing that 'plus size models' should be in the public eye.	
20.	76	Watching too much television can cause kids to be overweight and obese.	0.637
21.	30	I can say this because I was obese. I've been there and made all the excuses! Stop molycoddling people & promote healthy lifestyle change!	0.584
22.	38	I despise parents who say that it is not their fault that their child is overweight.	0.584
23.	52	Pizza Hut offers free pizza to everyone called Charlotte this weekend, as a token of their devotion to childhood obesity.	0.576
24.	16	Overweight type-2 diabetes patients outlive thinner ones, study says.	0.576
25.	57	The government were saying that, they might implement an obesity tax, as a scheme to battle obesity.	0.522
26.	69	Obesity is a frequently overlooked factor that can contribute to an increased cancer risk.	0.522
27.	20	Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would not be loving your curves.	0.522
28.	21	Lack of sleep is putting children at risk of overweight and obesity.	0.469
29.	75	I hate when I go shopping and I can't find sizes for overweight people, it's so difficult to find and when you find something it's horrible.	0.469
30.	37	Every time my dad sees an overweight person & says "Look at that fat fuxx." saves me from letting my weight get out of control.	0.407
31.	46	1-4 children in America are obese, but please keep telling me how bad cutting weight is for my body.	0.407
32.	25	If I was getting overweight or obese, and my friends were telling me "Rock it girl", "love yourself". I would get away from these friends.	0.407
33.	44	I was once obese. Trust me, you're lying to yourself if you have the 'as long as I'm happy' mentality to justify your condition.	0.292
34.	34	Hyperinsulinemia drives diet-induced obesity independently of brain insulin production.	0.115
35.	31	Dr. Allen Litcher: "Obesity will likely surpass smoking as the leading preventable cause of cancer."	0.115
36.	5	Foods that are high in nickel are linked to obesity in some women.	-0.000
37.	64	You think I haven't tried to lose weight? Ask most overweight women and they have tried it is not as black and white as you may think.	-0.000
38.	3	Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.	-0.000



39.	12	An anti-obesity law has passed in Japan. It's now illegal to be overweight or fat in Japan.	-0.000
40.	45	I'm: So stressed. So depressed. So obese. So exhausted. So fat. So ugly. So worthless. So unwanted. So disappointing. So disgusting.	-0.115
41.	39	Studies suggest standing more could lower risk for obesity, illness, and death.	-0.177
42.	59	Everyone is getting skinny and I am getting obese.	-0.230
43.	28	I'm apparently overweight but I look good? Strange.	-0.230
44.	49	A salon owner claims that obese staff ruined her business by sneaking out for takeaways.	-0.284
45.	55	Standing desks are coming to schools, to cure obesity and increase attention spans.	-0.292
46.	56	Physical inactivity is a bigger risk factor for early death than "Smokadiabesity" (smoking, diabetes and obesity together).	-0.292
47.	26	Eating micronutrient or fiber-rich bar two times per day increase metabolism and decrease inflammation in obese people without diet change.	-0.292
48.	40	15 minutes of laughter everyday can help reduce your risk of obesity and boost your metabolism.	-0.300
49.	62	I used to tell myself I'm naturally overweight, I'm naturally big boned. But there are no fat people. Take Action!	-0.346
50.	48	Reduced stress level can help obese people to lose weight.	-0.407
51.	68	I was overweight but when I started doing gymnastics, I lost weight and I am not that skinny but confident.	-0.407
52.	14	Wealthier men have a higher rate of obesity than poor. Poor women have higher rate of obesity than wealthier women.	-0.407
53.	18	I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.	-0.522
54.	63	Obesity due to bad diet not lack of exercise.	-0.522
55.	66	I've met a few people who say they don't like the taste of water. They were all obese. I assume it's correlated.	-0.584
56.	41	4 out of 5 firefighters in US are overweight or obese, and about half of firefighters killed in the line of duty suffer heart attacks.	-0.699
57.	1	Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	-0.699
58.	11	You see fat families? When the mum is obese. The dad is obese. And so are the kids? Sickening. They should be banned from public.	-0.814
59.	60	Parents rarely spot child obesity.	-0.814
60.	2	Study identifies childhood obesity as a risk factor for	-0.814

		dropping out of school.	
61.	17	Teenagers who misperceive their weight as overweight are actually more likely to overeat compared to teenagers who accurately perceive their weight.	-0.814
62.	65	Overweight prevalence of pre-school children in ASEAN. It is alarming!!!	-0.876
63.	9	Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.	-1.052
64.	7	You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	-1.160
65.	58	A new study shows many overweight people have a distorted self-image. They tell themselves, I'm not fat. I'm just easy to see.	-1.221
66.	36	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	-1.221
67.	19	If you make fun an overweight person working out at the gym I'll key your vehicle.	-1.221
68.	29	McDonald's targets children to ensure that future generations grow up obese and lethargic.	-1.221
69.	50	One way to lose weight? Studies show obesity is lower in marijuana users than in non-users.	-1.452
70.	4	Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".	-1.513
71.	24	People at a normal weight who believe they are fat have a much greater risk of becoming obese later in life.	-1.628
72.	22	Obese people may have lower dementia risk.	-1.628
73.	8	Several new studies add to a body of evidence that being overweight may have health benefits.	-1.628
74.	15	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	-1.805
75.	74	Overweight teen tries to defend himself: I have a slow metabolism. I'm a nervous eater. I'm related to RubeusHagrid (character in Harry Potter, who is a giant human).	-1.920
76.	54	Obesity is a rich people problem.	-1.920



Appendix 4.5.4: Factor Array of Factor I

Most Disagree											Most Agree
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	
11	2	8	59	44	4	13	35	53	27	23	
57	25	10	45	28	9	39	47	63	32	18	
7	49	76	41	67	56	40	62	61	6	36	
(3)	21	29	75	58	26	70	38	64	20	(3)	
	54	24	12	37	46	17	65	68	15		
	(5)	1	52	31	34	69	71	73	(5)		
		55	74	43	51	3	45	33			
		(7)	72	50	30	19	48	(7)			
			(8)	22	14	60	(8)				
				(9)	66	(9)					
					16						
					5						
					(12)						

Appendix 4.5.5: Factor Array of Factor II

Most Disagree											Most Agree
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	
11	25	50	74	24	56	34	69	39	43	1	
37	2	32	20	62	44	66	55	42	48	23	
54	19	15	61	5	14	53	40	60	70	63	
(3)	76	52	8	59	16	58	47	21	75	(3)	
	29	57	45	71	51	65	4	6	10		
	(5)	35	46	64	67	3	72	9	(5)		
		7	49	30	68	27	73	13			
		(7)	26	31	28	33	17	(7)			
			(8)	12	41	22	(8)				
				(9)	18	(9)					
					36						
					38						
					(12)						

*Appendix 4.5.6: Factor Array of Factor III*

Most Disagree											Most Agree
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	
54	8	29	17	18	44	16	6	73	10	23	
74	22	19	2	14	34	57	70	13	43	51	
15	24	36	60	68	31	69	61	42	53	67	
(3)	4	58	11	48	5	20	32	71	35		(3)
	50	7	1	62	64	21	76	47	27		
	(5)	9	41	40	3	75	30	72		(5)	
		65	66	26	12	37	38	33			
		(7)	63	56	45	46	52		(7)		
			(8)	55	39	25		(8)			
				(9)	59		(9)				
					28						
					49						
					(12)						

*Appendix 4.6.1.1: Characterizing and Distinguishing Statements of Factor I*

	NO.	STATEMENTS	I	II	III
<b>AGREE</b>	<b>18</b>	I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.	<b>5</b>	<b>0</b>	<b>-1</b>
	<b>36</b>	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	<b>5</b>	<b>0</b>	<b>-3</b>
	<b>32</b>	Being overweight is not healthy so I do not understand why people are arguing that 'plus size models' should be in the public eye.	<b>4</b>	<b>-3</b>	<b>2</b>
	<b>20</b>	Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would not be loving your curves	<b>4</b>	<b>-2</b>	<b>1</b>
	<b>15</b>	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	<b>4</b>	<b>-3</b>	<b>-5</b>
<b>DISAGREE</b>	<b>57</b>	The governments were saying that, they might implement an obesity tax, as a scheme to battle obesity.	<b>-5</b>	<b>-3</b>	<b>1</b>
	<b>7</b>	You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	<b>-5</b>	<b>-3</b>	<b>-3</b>
	<b>49</b>	A salon owner claims that obese staff ruined her business by sneaking out for takeaways.	<b>-4</b>	<b>-2</b>	<b>0</b>
	<b>21</b>	Lack of sleep is putting children at risk of overweight and obesity.	<b>-4</b>	<b>3</b>	<b>1</b>
<b>DISTINGUISHING</b>	<b>18</b>	I mean we complain about the obesity rate but yet it's \$1 for a double cheeseburger and \$10 for a small portion of a healthy meal.	<b>5</b>	<b>0</b>	<b>-1</b>
	<b>36</b>	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	<b>5</b>	<b>0</b>	<b>-3</b>
	<b>15</b>	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	<b>4</b>	<b>-3</b>	<b>-5</b>
	<b>19</b>	If you make fun an overweight person working out at the gym I'll key your vehicle.	<b>1</b>	<b>-4</b>	<b>-3</b>
	<b>50</b>	One way to lose weight? Studies show obesity is lower in marijuana users than in non-users.	<b>-1</b>	<b>-3</b>	<b>-4</b>
	<b>43</b>	No respect for people attacking overweight people at the gym who are trying to turn their life around.	<b>-1</b>	<b>4</b>	<b>4</b>
	<b>72</b>	For each hour of sleep lost, the odds of an adolescent being obese rise by 80%.	<b>-2</b>	<b>2</b>	<b>3</b>
	<b>10</b>	When more people are dying from obesity than starvation, there is a big problem	<b>-3</b>	<b>4</b>	<b>4</b>
	<b>21</b>	Lack of sleep is putting children at risk of overweight and obesity.	<b>-4</b>	<b>3</b>	<b>1</b>

*Appendix 4.6.1.2: Characterizing and Distinguishing Statements of Factor II*

	NO.	STATEMENTS	I	II	III
AGREE	1	Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	-3	5	-2
	63	Obesity due to bad diet not lack of exercise.	3	5	-2
	48	Reduced stress level can help obese people to lose weight.	2	4	-1
	70	Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.	1	4	2
	75	I hate when I go shopping and I can't find sizes for overweight people, it's so difficult to find and when you find something it's horrible.	-2	4	1
DISAGREE	37	Every time my dad sees an overweight person & says "Look at that fat fuxx." saves me from letting my weight get out of control.	-1	-2	1
	19	If you make fun an overweight person working out at the gym I'll key your vehicle	1	-4	-3
	76	Watching too much television can cause kids to be overweight and obese.	-3	-4	2
	29	McDonald's targets children to ensure that future generations grow up obese and lethargic.	-3	-4	-3
DISTINGUISHING	1	Calling obesity a disease causes obese people to be less motivated to lose weight and make healthy choices, according to a study.	-3	5	-2
	36	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	5	0	-3
	61	I am overweight and this is nothing but facts. We should not promote unhealthy lifestyles.	3	-2	2
	20	Obese people who glamorize their weight annoy me because it is unhealthy and when you are having a heart attack, you would not be loving your curves.	4	-2	1
	35	I am totally against fat shaming, but do not tell people that it is great and okay to be obese or overweight.	2	-3	4
	32	Being overweight is not healthy so I do not understand why people are arguing that 'plus size models' should be in the public eye.	4	-3	2
	37	Every time my dad sees an overweight person & says "Look at that fat fuxx." saves me from letting my weight get out of control.	-1	-5	1

*Appendix 4.6.1.3: Characterizing and Distinguishing Statements of Factor III*

	NO.	STATEMENTS	I	II	III
AGREE	51	I love this whole love your body movement, but if you are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.	0	0	5
	67	Obesity is becoming a real problem in the United Kingdom.	-1	0	5
	53	Seeing an overweight person working hard in the gym is very motivating for me.	3	1	4
	35	I am totally against fat shaming, but do not tell people that it is great and okay to be obese or overweight.	2	-3	4
DISAGREE	74	Overweight teen tries to defend himself: I have a slow metabolism. I'm a nervous eater. I'm related to RubeusHagrid (character in Harry Potter, who is a giant human).	-2	-2	-5
	15	Make-up can't hide my obesity. Only starvation can remove my fat. I don't want to be looking at obesity in the mirror forever. I must change.	4	-3	-5
	8	Several new studies add to a body of evidence that being overweight may have health benefits.	-4	-2	-4
	22	Obese people may have lower dementia risk.	-1	1	-4
	24	People at a normal weight who believe they are fat have a much greater risk of becoming obese later in life.	-3	-1	-4
	4	Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".	0	2	-4
	50	One way to lose weight? Studies show obesity is lower in marijuana users than in non-users.	-1	-3	-4
DISTINGUISHING	51	I love this whole love your body movement, but if you are extremely under/overweight, it shouldn't be glorified. Like you're killing yourself.	0	0	5
	67	Obesity is becoming a real problem in the United Kingdom.	-1	0	5
	76	Watching too much television can cause kids to be overweight and obese.	-3	-4	2
	57	The government were saying that, they might implement an obesity tax, as a scheme to battle obesity	-5	-3	1
	25	If I was getting overweight or obese, and my friends were telling me "Rock it girl", "love yourself". I would get away from these friends.	-4	-4	1
	63	Obesity due to bad diet not lack of exercise.	3	5	-2
	11	You see fat families? When the mum is obese. The dad is obese. And so are the kids? Sickening. They should be banned from public.	-5	-5	-2
	17	Teenagers who misperceive their weight as overweight are actually more likely to overeat compared to teenagers who accurately perceive their weight.	1	2	-2
	65	Overweight prevalence of pre-school children in ASEAN. It is alarming!!!	2	1	-3
	9	Obesity is more heritable than schizophrenia, high blood pressure, and alcoholism.	0	3	-3
	36	For now I think it's enough to just remind you that most severely obese people are struggling with mental issues as well as physical ones.	5	0	-3
	4	Being obese is as dangerous as being anorexic. Yet one of these serious issues is protected via "anti-shaming" and "body positivity".	0	2	-4
	22	Obese people may have lower dementia risk.	-1	1	-4

*Appendix 4.6.4.1: Consensus Statements*

* indicating Non-Significant at P>.05					
No.	Statement	I	II	III	General description of position
2	Study identifies childhood obesity as a risk factor for dropping out of school.	-4	-4	-2	Disagree
3*	Both ancient Egyptian and Greek medicine recognized obesity as a medical disorder.	1	1	0	Neutral
5*	Foods that are high in nickel are linked to obesity in some women.	-1	-1	1	Neutral
6*	Plus Size Appreciation is not promoting obesity. It's making people who are constantly put down feel good about themselves.	4	3	2	Agree
7*	You look healthy = You look fat; You're too skinny = You're doing it right; You look normal = You are obese.	-5	-3	-3	Disagree
8	Several new studies add to a body of evidence that being overweight may have health benefits.	-4	-2	-3	Disagree
12*	An anti-obesity law has passed in Japan. It's now illegal to be overweight or fat in Japan.	-2	-1	-2	Disagree
13*	Training leg is painful especially when you are an overweight baby boomer. But I am going to do this.	1	3	3	Agree
14*	Wealthier men have a higher rate of obesity than poor. Poor women have higher rate of obesity than wealthier women.	0	0	-1	Neutral
16*	Overweight type-2 diabetes patients outlive thinner ones, study says.	-1	0	1	Neutral
23*	Being overweight is unhealthy and it is your personal responsibility to do your best to become fit. Please do.	5	5	5	Most Agree
26*	Eating micronutrient or fiber-rich bar two times per day increase metabolism and decrease inflammation in obese people without diet change.	0	-2	-1	Disagree
28*	I'm apparently overweight but I look good? Strange.	-1	0	-2	Disagree
29*	McDonald's targets children to ensure that future generations grow up obese and lethargic.	-3	-4	-4	Disagree
30*	I can say this because I was obese. I've been there and made all the excuses! Stop molycoddling people & promote healthy lifestyle change!	0	-1	2	Neutral
31*	Dr. Allen Litcher: "Obesity will likely surpass smoking as the leading preventable cause of cancer."	-1	-1	0	Neutral
33*	Stop promoting being morbidly obese as beautiful. You wouldn't do it with anorexia, it's not beautiful. It's a death sentence.	3	1	3	Agree
34*	Hyperinsulinemia drives diet-induced obesity independently of brain insulin production.	0	1	2	Agree
38*	I despise parents who say that it is not their fault that their child is overweight.	2	0	0	Neutral
40	15 minutes of laughter everyday can help reduce your risk of obesity and boost your metabolism.	1	2	1	Agree
41*	4 out of 5 firefighters in US are overweight or obese,	-2	0	-1	Disagree

	and about half of firefighters killed in the line of duty suffer heart attacks.				
42*	Important reminder: not every overweight person dislikes their body and wants it to change!!! Do not project societal standards on us!!!	2	3	2	Agree
44	I was once obese. Trust me, you're lying to yourself if you have the 'as long as I'm happy' mentality to justify your condition.	-2	0	0	Neutral
45*	I'm: So stressed. So depressed. So obese. So exhausted. So fat. So ugly. So worthless. So unwanted. So disappointing. So disgusting.	-2	-2	0	Disagree
46	1-4 children in America are obese, but please keep telling me how bad cutting weight is for my body.	0	-2	-2	Disagree
47*	I'm sorry but the people who embrace obesity only do so because they're too lazy to fix it.	2	2	3	Agree
53	Seeing an overweight person working hard in the gym is very motivating for me.	3	1	2	Agree
54*	Obesity is a rich people problem.	-4	-5	-5	Most Disagree
56*	Physical inactivity is a bigger risk factor for early death than "Smokadiabesity" (smoking, diabetes and obesity together).	0	0	-1	Neutral
59*	Everyone is getting skinny and I am getting obese.	-2	-1	-2	Disagree
69*	Obesity is a frequently overlooked factor that can contribute to an increased cancer risk.	1	2	1	Agree
70*	Eating disorders are not just extremely thin people. They can be overweight morbidly obese or a normal weight person.	1	4	4	Agree
73*	I admire an overweight person in the gym trying to get right. I was once there, my friends.	3	2	4	Agree

All factors agree that not every overweight person dislikes his or her body and wants it to change and therefore societal standards should not be placed on them (42: +2, +3, +2). Besides, all factors support behaviour change towards a more healthy body shape (13: +1, +3, +3). Meanwhile, all factors feel motivated when seeing the obese people working hard in the gym (53: +3, +1, +2; 73: +3, +2, +4). Furthermore, all believe that overweight, morbidly obese or a normal weight person could have eating disorders, not only just extremely thin people (70: +1, +4, +4).

In contrast, all factors completely disagree that obesity is a rich people problem (54: -4, -5, -5). In addition, the result shown that about being overweight might not have health benefits (8: -4, -2, -3). Also, an anti-obesity law has passed in Japan and it is now illegal to be overweight or fat in Japan is disagreed by all factors (12: -2, -1, -2).